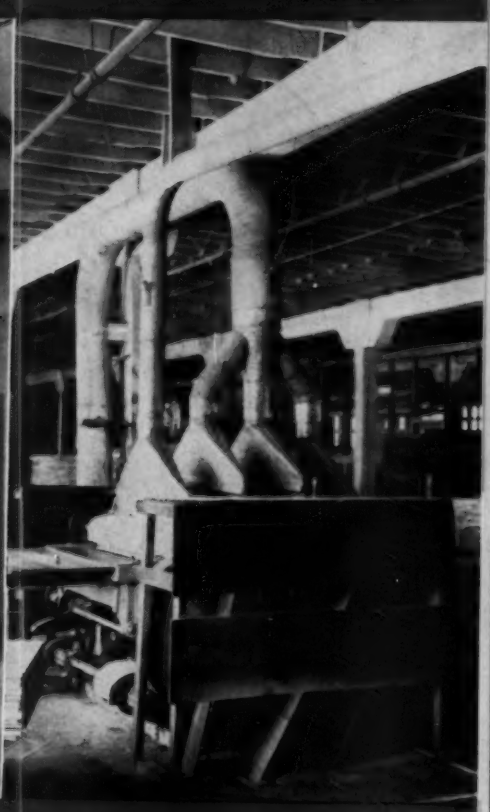
AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING--SHEET METAL CONTRACTING



APRIL, 1946

Veteran Housing Program Order No. 1 (with explanation) - - - - - - Page 50
An Approved "In-shop" G.I. Training Schedule - - - - - - - - - Page 55
How Non-union Employers Can Employ a Veteran - - - - - - - - Page 56

Steadily Becoming Available . . .

To Make More Steady Profits for YOU!

CLAYTON & LAMBERT LAMNECK FITTINGS

C&L

• Across America value-wise Jobbers are full of smiles for *happy* days are here again! Yes, they have started getting top-quality LAMNECK money-makers again . . . and now they can *really* go to town.

No need to tell you that C&L Lamneck Furnace Pipe, Prefabricated Duct and Simplified Furnace Pipe and Fittings for gravity and air conditioning systems get *first* call every time. They're so convenient to use!

Get on the Clayton & Lambert Profit Bandwagon for 1946! There's business galore waiting for you. Write today for the name of your nearest *C&L Lamneck distributor* and for new catalog.

CLAYTON & LAMBERT MFG. CO.

Middletown Division • Middletown • Ohio C&L

New! USAIRCO EVAPORATIVE KOOLER-AIRE

POINTS THE WAY TO MORE COOLING *Business*

● The new USAIRCO Evaporative Kooler-aire meets your needs best for customer comfort-cooling jobs. It is simple and easy to install; provides the finest in evaporative cooling for your installations.

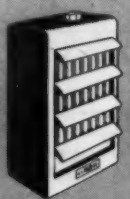
Kooler-aire uses 100% fresh outside air, cleans, washes, filters and cools the air for proper delivery to the room area. Low in first cost . . . economical to operate . . . Kooler-aire opens a big cooling market for you!

You'll find the vast experience of USAIRCO's staff of engineers of real help to you on your installations of Kooler-aire evaporative units. You get the accumulative design and application know-how of evaporative cooling engineers who have pioneered and led the industry for over two decades.

Plan now to get your share of this big cooling business . . . USAIRCO Evaporative Kooler-aire units will help keep you out in front. Write now for your copy of "Kooler-aire's 1946 Program."

CENTRIFUGAL BLOWERS

PROPELLER FANS



UNIT AND BLAST HEATERS

United States Air Conditioning Corporation

MINNEAPOLIS 14, MINNESOTA

USAIRCO

Makers of the most complete line of air handling equipment

AMERICAN ARTISAN

with which are merged FURNACES & SHEET METALS — Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

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In This Issue

THE RECENTLY announced Veteran Housing Program Order No. 1 caused consternation. As first announced the reaction was—"This stops construction." But in the weeks which have followed, Washington has turned handsprings clarifying and "softening" the first publicity.

Right now it appears VHP-No. 1 will not work the hardship we feared. Before you close your doors, submit to your FHA office two signed letters from the owner stating the work is essential. FHA has stated that for the time being, at least, consideration will be lenient.

The order in full begins on page 50. Alongside the sections of the order, we have published pertinent comment. The comments will, we believe, give readers encouragement, and explain what is meant and what you can do.

•

Arnold Kruckman, on page 48, devotes his Washington Letter to VHP-No. 1 and gives us the last minute thinking of men in charge and a review of the objections, now being lobbied in Washington.

•

Employers of non-union labor have been asking how they can employ a veteran under the veteran training program. On page 56 General Bradley of Veterans Administration tells how to qualify for the program—when your shop is non-union.

•

Readers understand that to get approval as a shop to train a G.I., a training program must be submitted to the proper state board (usually the State Board of Education). Fox Valley Furnace & Sheet Metal Ass'n (Illinois) has worked out three schedules and had them approved (on page 55).

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Founded 1880

APRIL, 1946

Volume 115, No. 4

We've Not Been Bragging!

Here is one of hundreds of examples of JOBBER enthusiam

. . . over **SYNCROMATIC**

COAL, OIL and GAS Furnaces

Get on the **"SUCCESS BAND WAGON"**

write your nearest jobber . . . or write direct

Syncromatic Corporation

5110 N. THIRTY-FIFTH ST., MILWAUKEE, WIS. WATERTOWN, WIS.

Them's Strong Words, Mr. S.!

ELECTRIC STATES MFG. CO. DESIGNING ENGINEERS
MANUFACTURING AND

STATES ELECTRIC MANUFACTURING CO.

Panelboards—Welded Steel Cabinets—Electrical Distribution Apparatus

MAIN OFFICE AND WORKS: 810 GLENWOOD AVENUE
MINNEAPOLIS, MINNESOTA

January 27, 1946

Sciaky Bros.
4915 West 67th St.
Chicago, Illinois

Gentlemen:

The wonderful performance of your PMCR O-2 that we installed about two months ago has prompted me to write this letter of appreciation. It is built so well that we are convinced that we have received more than our moneys worth. It is one of the finest investments that we have made.

I was pleased very much with the attention and service that you have given me since the purchase of this welder, and to reciprocate allow me to offer my time and welder to any prospective purchaser in this section of the country who is at all doubtful when you say, "It's the finest welder ever made."

With many wishes for your continued success, I am

Very truly yours,

STATES ELECTRIC MFG. CO.

A. B. Shallbetter

SERIES PMCR-O

The machine praised by Mr. Shallbetter is one of a Series of small completely automatic welders. Several features make it unique for a machine of its size. Heavy duty roller bearings at the fulcrum point of the rocker arm assure long life. Retraction stroke is provided. Machine is a complete self-contained unit with electronic controls mounted in hinged cabinet convenient to operator. Standard frame and control unit may be furnished with any of 5 transformer sizes: 20, 30, 40, 50 and 75 KVA. Throat depth can be varied by a choice of 5 arm lengths: 12", 18", 24", 30" and 36". Thus, machine can be chosen to cover a range of capacities from 26—22 up to 28—11 gauge clean mild steel.

Write for descriptive bulletin No. 112-D

YES SIR! When the busy owner of a plant making electrical distribution equipment takes time out to sit down and write the above letter, he must have something to shout about.

It's the result of a long-standing conviction on the part of Sciaky Bros. that resistance welding is strictly a *production process*. Machines must therefore be designed to both, (1) produce sound welds and (2) stand up under continuous production conditions. To this end, Sciaky welders are engineered for *long life* and to be as *maintenance-free* as possible.

Furthermore, when you have trouble (and who doesn't, now and then), our service engineers are always on call to help out. We'd like to have the opportunity of proving "It's the Finest Welder ever Made" to you, too.

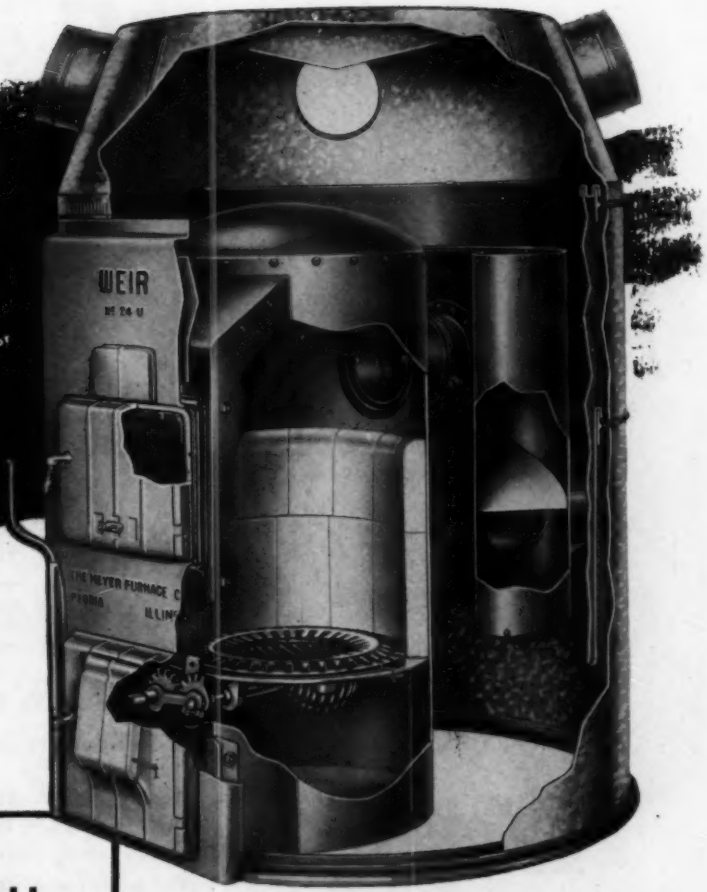
SCIAKY BROS.

4905 W. 67th ST. CHICAGO 38, ILL.

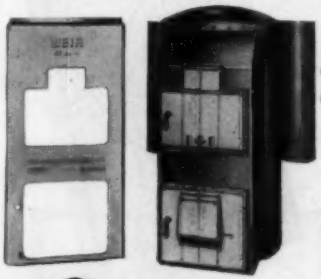
NEW

THE WEIR "U" SERIES STEEL FURNACE WITH THE INTEGRAL HEATING ELEMENT*

*Patent applied for

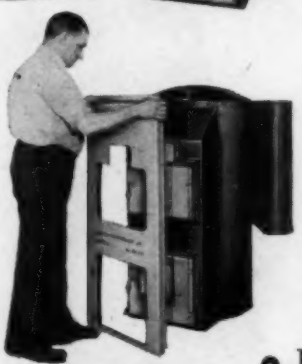


A MAJOR IMPROVEMENT in furnace design and construction. Eliminates the need for a cumbersome casting for the furnace "front". Drum, pouch, and door seats are *one piece*—riveted and welded for *permanent* tightness!

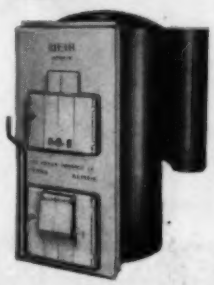


EASY TO INSTALL

1 INTEGRAL HEATING ELEMENT* comes with doors attached. Door seats and doors are surface ground for perfect fit. Riveted & welded construction of Heating Element assures permanent tightness.



2 Front is pressed steel. Slips over pouch and bolts firmly in position. Modern, attractive, streamlined design. Casing hooks into front Attachment method keeps basement dirt out of air stream.



3 Here's the WEIR "U" Series as it looks with slip-over front in place. The fire is completely enclosed in heavy gauge steel. Slip-over front is not exposed to the fire. Thoroughly tested and proved, the new-design WEIR "U" Series furnace sets new standards of cleanliness and finer performance.

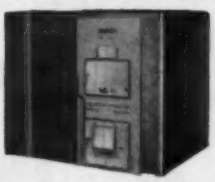
Famous WEIR Features

Many WEIR furnaces have records of over *50 years* continuous service! The tested and proven lifetime WEIR features that have won leadership for WEIR-MEYER Modern Heat are incorporated in the WEIR "U" Series. *Steel* for quicker heat transfer—riveted & welded construction for permanent tightness—larger radiator for greatest efficiency — inside protecting collar — duplex grate — swinging smoke curtain — many other famous WEIR features.

Truly, WEIR-MEYER MEANS Modern Heat

THE MEYER FURNACE COMPANY

General Offices — PEORIA 2, ILL.
Factories at Peoria and Peru, Ill.



THE WEIR "U" SERIES AIR CONDITIONER. All the advantages of the WEIR "U" Series furnace with INTEGRAL HEATING ELEMENT* *plus* rectangular casing of modern design for Air Conditioning.

Since 1866

P-K TYPE "A"
SHEET METAL SCREW

TIME-TRIED "SHORT CUT" to lower cost, stronger assemblies, Type "A" is the standard fastening wherever sheet metal is fabricated. There's nothing like it for ducts, fan housings, exhaust systems,—any assembly of light (up to 18 gauge) sheet metals. Type "A" has helped sheet metal contractors do better work and make bigger profits for the past twenty-five years. Slotted or Phillips head.

P-K TYPE "Z"
SELF-TAPPING SCREW

BY-PASS TAPPING TIME AND TROUBLE on heavier sheets (up to 6 gauge) where you might consider using machine screws or bolts, or riveting. The P-K Type "Z" eliminates tapping and awkward nut running. It forms a tight fitting thread as it goes in—holds securely, even under severe vibration. Assembly savings up to 50%. Can be removed or replaced repeatedly without impairing security. Slotted or Phillips heads. Made also in 18-8 Stainless Steel for use in equipment for restaurants, taverns, laundries, etc.

FIGURE THE TIME required for fastenings in your operations, inside or outside the shop, and you'll see why it's plain common sense to make all the savings possible with P-K Screws. Records show that P-K fastening specialists can show you a "short cut" in 7 out of 10 assemblies.

Get acquainted with the complete line. Write for Booklets Nos. 480 and 475A. Booklet No. 480 lists proper hole sizes for efficient driving and maximum security, also illustrates types of holes recommended. SAMPLES, too. Just tell us what you are fastening. Parker-Kalon Corp., 208 Varick Street, New York 14.

PARKER-KALON **P-K** **SELF-TAPPING SCREWS**

A FASTENING FOR EVERY METAL AND PLASTIC ASSEMBLY

MEETS the DEMAND for *Fully Automatic* COAL HEAT...

"O. P." COAL BURNER

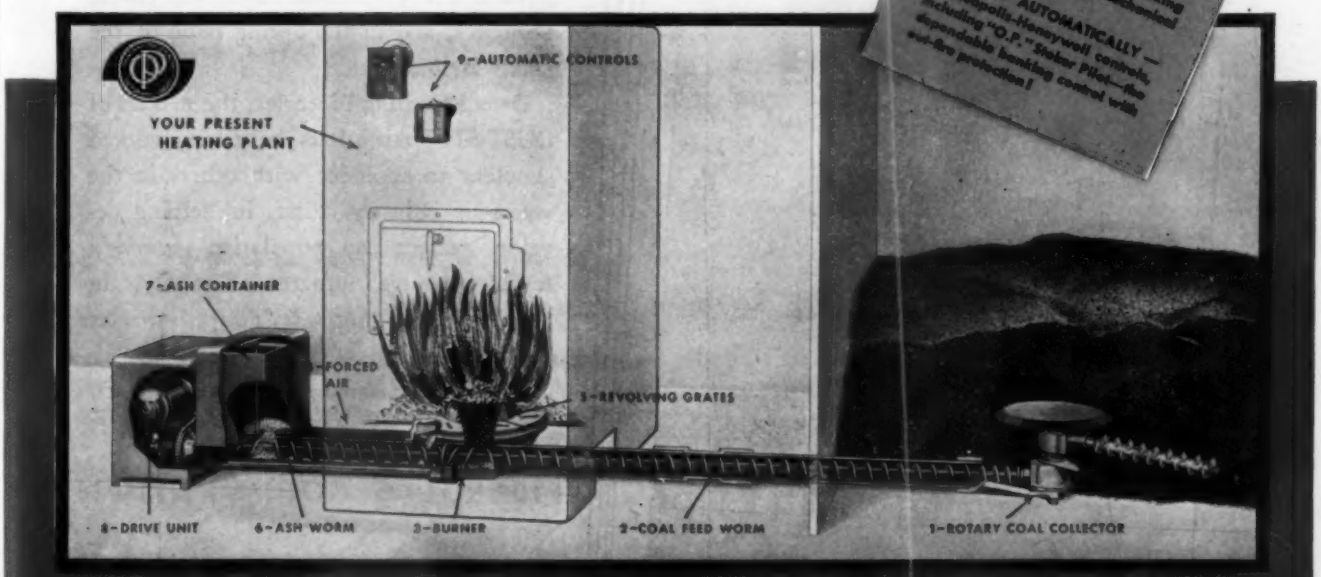
Automatic from coal bin to ash container!

The maximum of comfort, economy and convenience with *fully automatic* coal heat—that's what home owners are demanding.

"Original Pocahontas" Coal Burner gives them just that—the *comfort* of even coal heat, regulated by automatic controls—the *economy* of burning low-cost screenings—and the *convenience* of not having to shovel coal or dig clinkers.

Sell the bituminous coal burner that for over 11 years has been providing fully automatic coal heat in thousands of homes. Write today for information on the complete line of "O.P." equipment. There are still good dealership territories available.

POCAHONTAS FUEL COMPANY INCORPORATED
Stoker Division
338 East 131st Street • Cleveland 8, Ohio



"O. P." COAL BURNER

THE FIRST SUCCESSFUL BITUMINOUS FIN-FEED ASH REMOVAL COAL BURNER ... SUCCESSOR TO THE STOKER

IT'S *Your Advertising*

Some things to Remember!
. . . before you choose your next heating system!
HOUSE CLEANING—the *dirty* kind—can be made a lot easier in your new home. You'll save work, save redecorating costs—your draperies and home furnishings will last longer, too—when you heat with a *forced-warm-air system*.
Efficient, replacement-type filters inside the blower cabinet remove harmful dust and lint as the air passes through the heating unit. Moisture, for proper humidity, is also added—then the clean, comforting heat is gently circulated through your home.
Inexpensive to use, forced-warm-air heat has revolutionized home heating in the past decade. Get all the facts about it before you buy, build or remodel your home. Ask your architect, builder or heating contractor about it today!
DUST-STOP® AIR FILTERS, a *Fiberglas* product, are standard equipment in most forced-warm-air furnaces. Replacement filters are available in every community. Owens-Corning Fiberglas Corporation, 1904 Nicholas Building, Toledo 1, Ohio.
DUSTOP
Air Filters

Yes, reaching millions each month, telling and selling the advantages of CLEAN, WARM-AIR HEAT

Month in and month out, since early last fall, the makers of DUST-STOPS have been *promoting your business*—selling modern *warm-air heating* and *winter air-conditioning* to millions.

Newest advertisement in this colorful, interest-compelling campaign is that shown at the left, a "natural" for the house-cleaning season. It appears in the April issues of American Home and House Beautiful, and in the Spring issue of the Small Homes Guide.

Owens-Corning Fiberglas, the makers of DUST-STOP Air Filters, have long worked shoulder to shoulder with others in the warm-air industry. First, in helping develop, perfect and popularize *yesterday's* forced-warm-air furnaces. Secondly, in aggressively selling *today's* superb winter air-conditioning to the public.

Yes, it's your advertising...as well as ours.

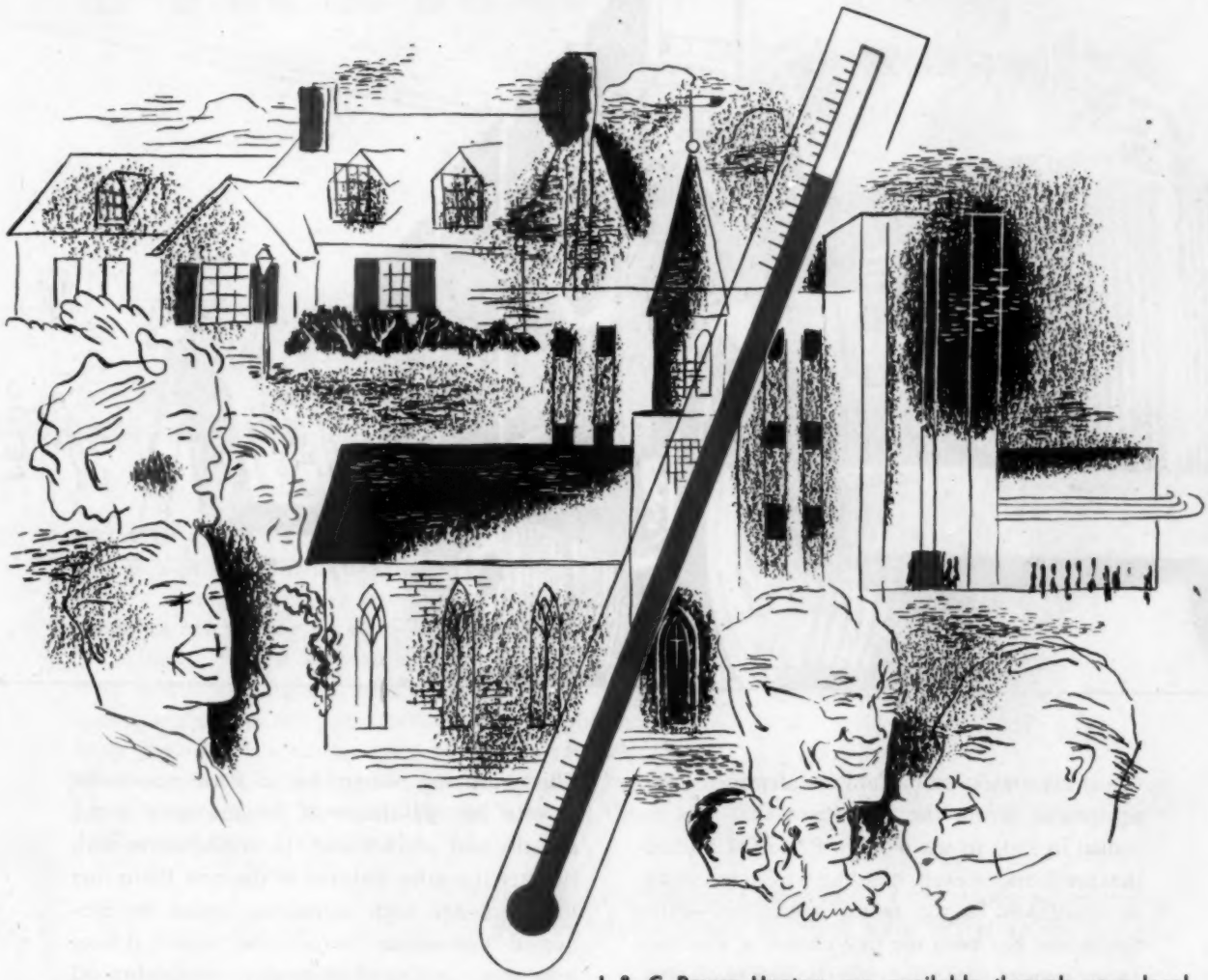
OWENS-CORNING
FIBERGLAS CORPORATION

"Your partner whose Actions speak louder than words"

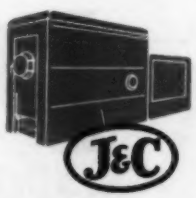
MEMBER

CONSTANT, ECONOMICAL, HEAVY DUTY HEATING IS EASY WITH A J & C UNIT

EFFICIENT HEATING FOR SCHOOLS, CHURCHES, BUILDINGS AND LARGE HOMES



J & C Power Heaters are available through your local jobber for all homes, apartments, churches, schools, offices, stores and factory buildings. Their 90% direct radiation surface captures more usable heat from burning fuel, and the efficient blower system uniformly distributes it to every portion of the building. It's comfortable, healthful heat—humidified, filtered and changed as often as desirable. J & C Power Heaters, engineered in a compact, well designed unit, are readily adaptable to burn coal, gas, or oil. A durable one-piece doubly-welded construction prevents dirt and fumes from escaping into the air stream, insures long life at low maintenance. It is a product of Jackson & Church Company, established in 1881.

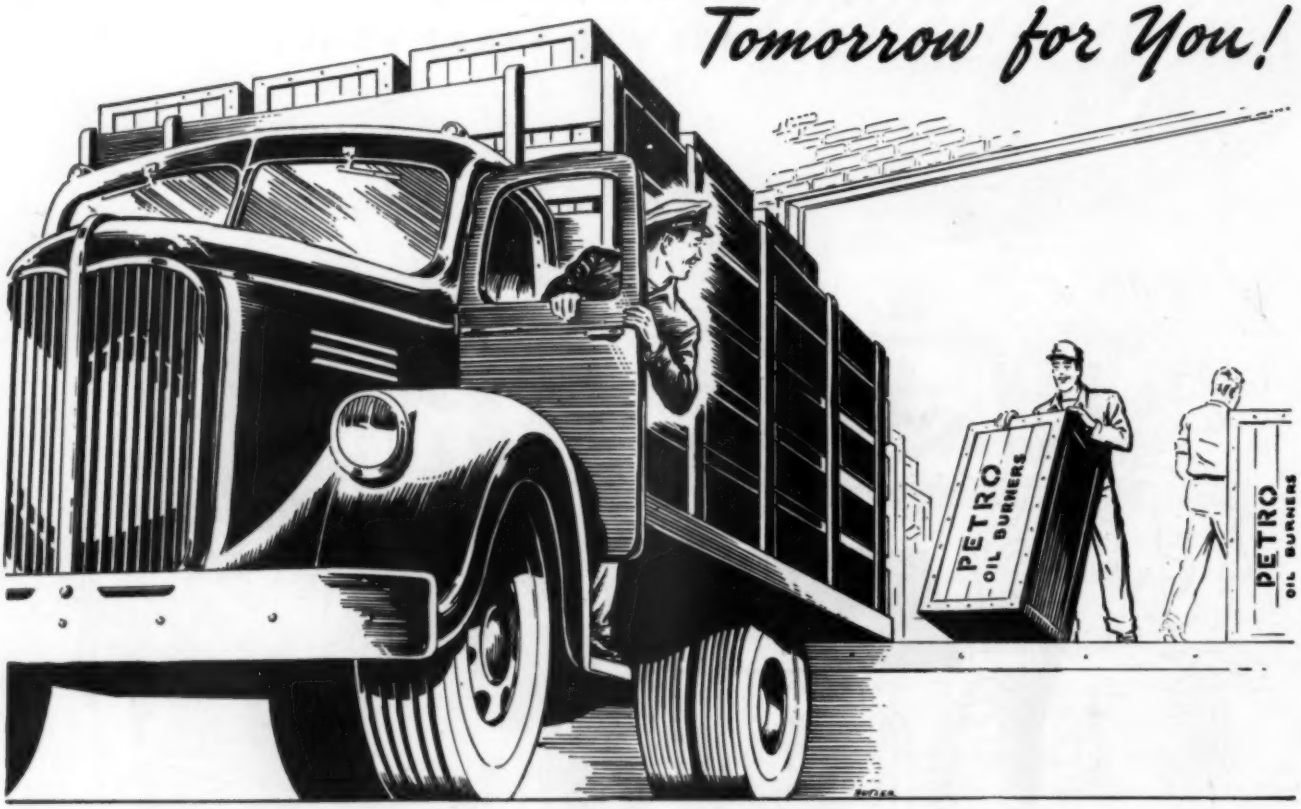


"WORK WELL DONE SINCE '81."

JACKSON & CHURCH COMPANY • SAGINAW, MICHIGAN

Today's Unprecedented Demand For PETRO

foretells PEAK SALES *Tomorrow for You!*



GOOD PERFORMANCE has always identified Petro equipment. From the first Petro that was installed in 1903 to the modern Petro Oil Burners that are found in every building—from the smallest bungalow to the tallest skyscraper—Petro equipment has been the first choice of discriminating owners who want only the best in oil heat.

Today the demand for Petro is unprecedented. It is necessitating an all-time high in production that is destined to go still higher as soon as greater quantities of urgently needed component parts become available.

This gratifying recognition of Petro excellence is your best assurance of volume sales in the months and years ahead. In combination with the striking sales features of the new Petro line that includes both attractive, styled-for-eye-appeal "conversion" burners and "units", it foretells your continued leadership for quality oil burner equipment in your community.

Petro equipment is distributed through established heating supply houses. Upon request we'll gladly tell you the name of the one nearest to you.

PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT

PETRO FUEL OIL BULK PLANTS, DISTRIBUTION TERMINALS AND FACILITIES IN: BOSTON • PROVIDENCE • STAMFORD
MT. VERNON • NEW YORK • LONG ISLAND • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO

PETRO
REG. U. S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT
SINCE 1903

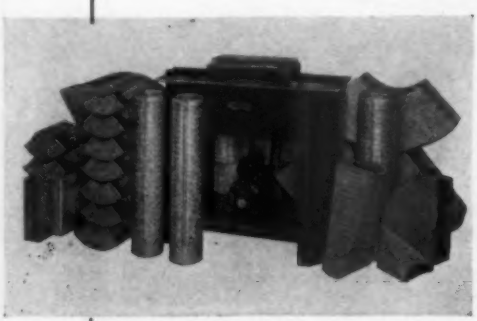
4,000,000 FEET OF PITTSBURGH LOCK

and still going

STRONG!

THE universal adoption of Lockformer equipment throughout the Sheet Metal Industry is explained by two facts: ONE, Lockformers are *money makers*—in big shops and in little ones. They save at least 50% in fabrication costs as against hand methods. TWO, Lockformers entail no maintenance problem; they just don't seem to wear out! The remarkable record reported by Mr. Narowetz (see below) is typical of their ability to "stay on the job"—year in and year out!

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

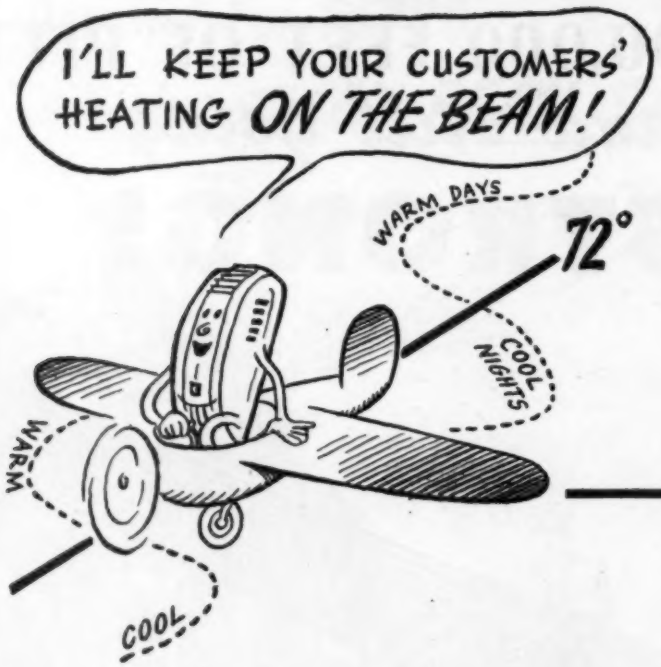


In a recent letter from the Narowetz Heating and Ventilating Company (one of the country's largest), Mr. Narowetz writes: "As you know, we have several Lockformers in our shop, one of which we purchased back in 1938. Just to satisfy my own curiosity, I've computed the amount of metal put through this machine on the basis of number of hours used per day. Even with a generous allowance for handling time, this figure amounts to over a half a million feet per year, or a total of approximately 4,000,000 feet. And this Lockformer, like the others, is still going strong! Any machine that can pile up a record like that deserves a pat on the back—hence this letter and my permission to quote me should you care to."

(Signed) Louis L. Narowetz, President

THE LOCKFORMER CO.

4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS



Up and Down Temperatures Waste Coal — right now is the time to put a Crise Control on your customer's hand-fired furnaces, whether it's steam, hot water, or warm air. You'll help him save up to 20% of usual coal supply — you'll give him 100% all-winter heating comfort at a saving!

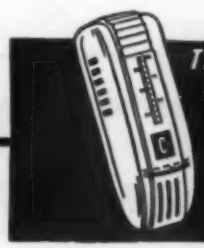
Easy To Install — Big Profits For You

Crise quality Controls are engineered for simplicity of installation and operation. You can serve more customers in less time — make more friends. There's a generous margin of profit in each sale, yet Crise Controls are not a luxury. All your customers can afford them.

SEE YOUR CRISE JOBBER AT ONCE

W. Crise

Executive Vice-President



The CRISE MANUFACTURING CO.
COLUMBUS 16, OHIO

THE WILLIAMSON HEATER COMPANY

what does this name mean?

To unnumbered thousands of Homes, for more than fifty years, the name Williamson has stood as a symbol of Comfort and Heating Satisfaction.

And to hundreds of distributors and retail Heating Contractors throughout the land, it stands for dependability and satisfaction . . . Plus pleasant associations that have survived and grown mutually profitable through the years . . . In the days to come you too, will find the same satisfaction with Williamson Heating Equipment whether it's Gravity or Forced Air . . . Pipe or Fittings.

THE WILLIAMSON HEATER CO. • CINCINNATI 9, OHIO

BECAUSE THEY ARE MADE

BETTER OF BETTER MATERIALS

CRESCENT TOOLS

HAVE BEEN RECOGNIZED AS

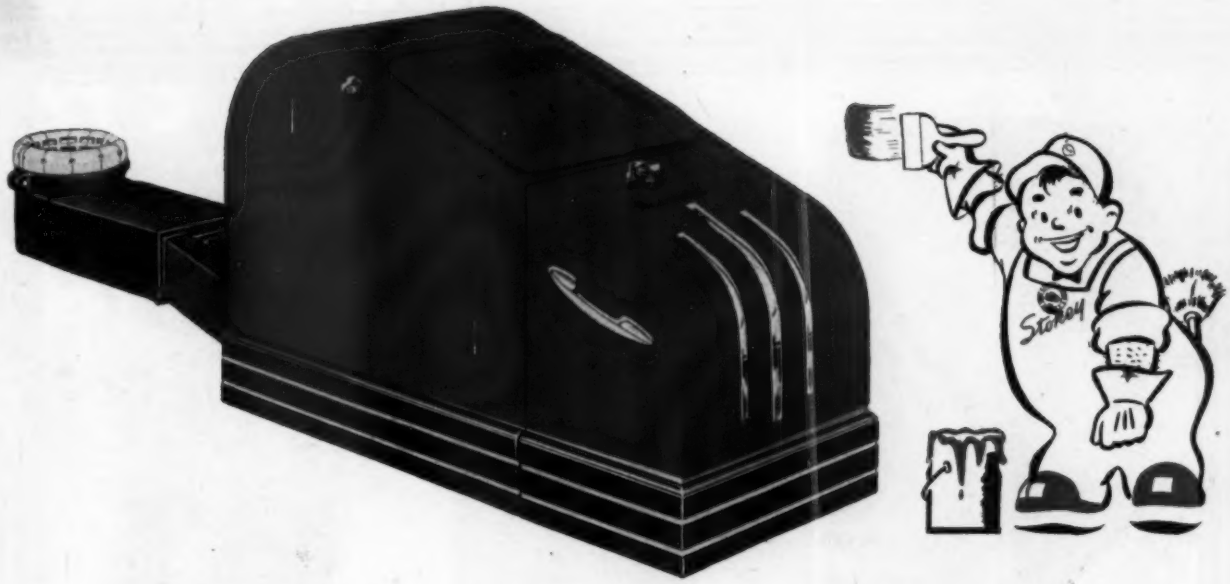
"BEST SELLERS"

FOR OVER 40 YEARS

CRESCENT TOOLS
Give Wings to Work

AT GOOD HARDWARE DEALERS EVERYWHERE

CRESCENT TOOL COMPANY, Jamestown, N. Y.



STOKOL is the *RED HOT PROFIT LINE* in the Stoker Field

Practically everyone who heats with coal is a Stokol Stoker prospect. The wide range of Stokol models and capacities will fill the bill whether the prospect owns a five-room cottage or a 15-floor apartment house. That's why we can say that Stokol is the *red hot profit line* in the stoker field!

From the dealer's point of view, Stokol offers the finest line of stokers it has ever manufactured—a reputation for the best that is backed by over 140,000 Stokol owners—and a dealer's agreement that is fair and packed with profit possibilities. A Stokol dealer need not be satisfied with a small slice of the market—he can go after the entire field with a complete line of domestic, commercial and industrial stokers—bin-feed or hopper models which burn all types of coal.

Some profitable territory is still open. Investigate the big Stokol profit opportunity by mailing the coupon today.

STOKOL

STOKOL STOKER CO., INC.
1145 E. 22ND ST., INDIANAPOLIS 7, IND.

Gentlemen: Send details of Stokol profit possibilities for me as a dealer.

NAME_____

ADDRESS_____

CITY_____ STATE_____

AA

Tear out and mail this coupon today! ⬆

Series A
Gas-Fired, Steel
Air Conditioning Units

Series G
Gas-Fired Steel,
Gravity Unit

Series H
Gas-Fired, Utility
Steel Air Conditioning Unit

EASY TO LOOK AT!
EASY TO SELL!

Luxaire's NEW 1946 GAS FIRED HEATING EQUIPMENT

Yes, Luxaire's New 1946 Gas-Fired line is definitely a sensation in the postwar heating market. It meets the latest stringent requirements of the American Gas Association!

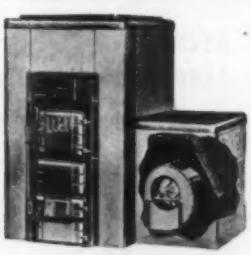
Never before has the buying public been offered heating and air-conditioning units so distinctive . . . so outstanding!

Never before has the instant Eye Appeal . . . Buy Appeal . . . been so predominate in any heating line.

Luxaire provides you with opportunity for a bigger share in postwar heating sales.

Luxaire

Series 8000
Oil-Fired, Steel Air
Conditioning Unit



Series AC-700
Coal-Fired, Steel Air
Conditioning Unit

Series 700
Coal-Fired, Steel
Gravity Furnace

Series C
Coal-Fired, Cast
Gravity Furnace

THE C. A. OLSEN MANUFACTURING CO. ELYRIA, OHIO

WHAT'S IN A CARLOAD?

WEIRZIN
Electrolytic Zinc-Coated Sheets and Strip, Plain or Bonderized

WEIRITE
Hot-Dip and Electrolytic Tin Plate, Tin Mill Black Plate, Plain or Bonderized, and Special Coated Manufacturing Ternes

WEIRTON
High-Carbon Strip

WEIRALEAD
(Lead Alloy) and Long Terne Sheets

WEIRCOLOY
Galvanized Sheets and Roofing Products

WEIRTON N-A-X
High-Quality Low-Alloy Steels

LACQUERED
and Coated Steel Strip

ALSO
Cold-Rolled Sheets
Cold-Rolled Strip
Hot-Rolled Sheets
Hot-Rolled Strip
Structurals

Carloads from Weirton may contain more than steel: they frequently carry faster deliveries—money-saving and time-saving that add up to increased profits for customers.

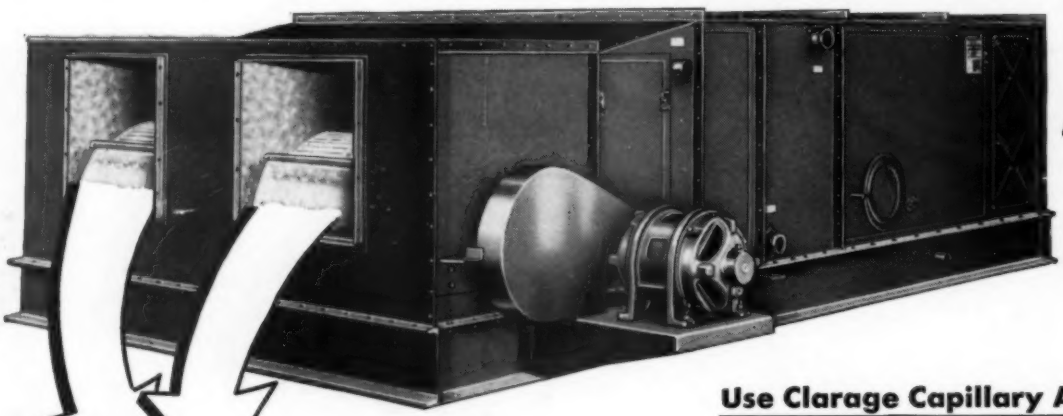
Integrated management—with all executives available right at the mill, and in constant touch with production, sales, shipments and laboratory work—means prompt decisions on customer problems . . . *eliminating delays when answers are needed fast.*

Integrated operations—with many types of steel products made "under one roof"—permit Weirton to combine many-product orders into single shipments for individual customers . . . with deliveries speeded, and unloading and handling costs at delivery points reduced.

One of the few completely integrated steel mills in the country, Weirton renders cost-cutting, time-saving services that are difficult to equal in the steel industry. If you need diversified types of steel, and prompt decisions on your steel problems, you will save money by doing business with Weirton.

WEIRTON STEEL CO.

WHEN YOUR PLANT AIR GOES IN HERE



Illustrated is a No. 34H3 Capillary Unit Conditioner with cooling and heating coils, providing complete air conditioning in one assembly.

It Comes Out Here

CLEAN and COOLED

HUMIDIFIED or DEHUMIDIFIED

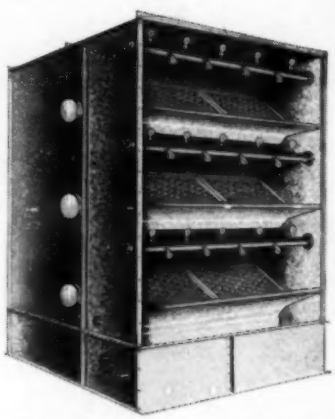
Use Clarage Capillary Air Conditioning Units where Accurate Control of Temperature and Humidity is Important — and where Maximum Air Cleanliness is Vital to Production, Uniform Quality of Product, Health or Safety.

Clarage Capillary Air Conditioners are complete factory assembled units, including a Capillary cleaning section, pump, heating coils, fan, drive and motor. They are available in seven sizes — 1800 to 20,000 c.f.m. Horizontal units, as shown above, are built in both Class I (con-current) and Class II (counter-current) types. Vertical units in Class II arrangement only.

There are excellent reasons for considering this modern air conditioning equipment: (1) Inexpensive to install — no costly building alterations required; (2) Everything in one "package" — no parts to assemble on the job; (3) Proper coordination and performance of all parts assured by factory tests; (4) Low first cost and low operating costs—the result of shrewd, advanced engineering.

★ ★ ★

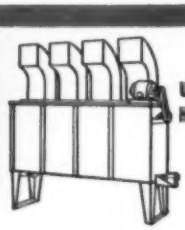
Write for our Bulletin 122. It gives complete information.



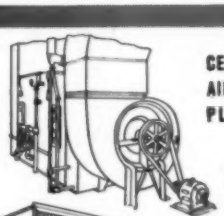
CAPILLARY AIR WASHERS

are available in a series of five height sizes, and in eleven widths — capacities from 4,400 to 132,000 c.f.m. They are built in Class I (con-current), Class II (counter-current) and Class III (con-current with coils) types. Bulletin 120 describes complete line of equipment.

SOME OF OUR OTHER PRODUCTS

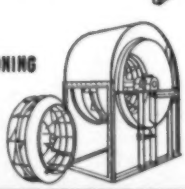


UNIT HEATERS



CENTRAL STATION AIR CONDITIONING PLANTS

AIR CONDITIONING AND VENTILATING FANS



AIR WASHERS

CLARAGE

FAN COMPANY

Kalamazoo, Michigan

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

D-60

You Build Your Business on the Sound Basic Principle of "Climate Control" . . . .

. . when you're a Mueller Climatrol "Comfort Merchant"

"Climate Control" means, basically, conditioning and handling of *air*. That's what you are selling, when you concentrate on the Mueller Climatrol line — with the assurance of delivering true indoor comfort and winning the good will of satisfied customers.

When your customer *starts right* with Climatrol, he is not only getting a modern system, but he is also in a position to take advantage of future air conditioning developments which can be added to the original Climatrol installation.

While it stands for the latest in home comfort, the Mueller Climatrol name also stands for one of the oldest performance records in the industry — 89 years of specialization in home heating. It is an old, dependable name, a well-known name — constantly promoted to your best prospects through color advertising in American Home, Better Homes and Gardens, and other magazines.

The Climatrol line is complete, enabling you to sell the right equipment for the job. Each Climatrol unit is specifically designed for efficiency with a particular fuel — gas, oil, or coal, whichever is preferred. Be a Climatrol comfort merchant — it pays!

Write for bulletins.

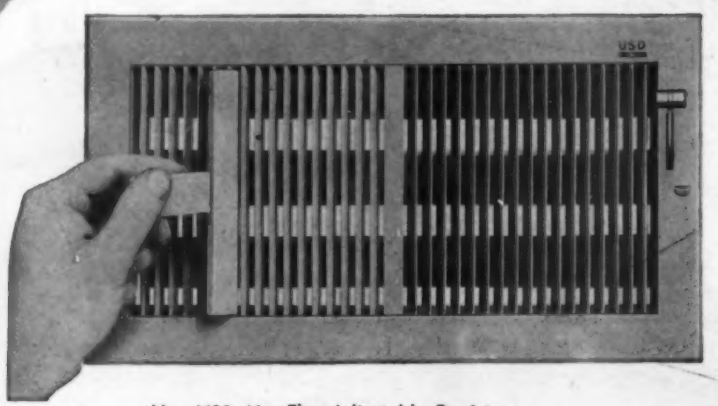
L. J. MUELLER FURNACE CO., 2010 W. Oklahoma Ave., Milwaukee 7, Wisconsin

MUELLER Climatrol

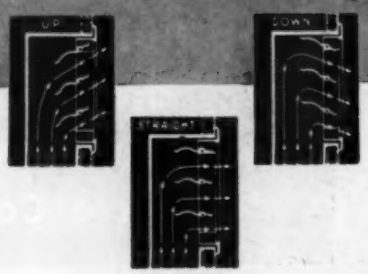
Reg. U. S. Pat. Off.

Auer AIRO-FLEX

the Simplified 4-WAY Directional REGISTER

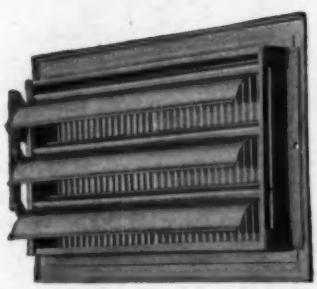


No. 4432 Airo-Flex Adjustable Register



The Airo-Flex "4400" line of air conditioning registers furnishes every real essential of 4-Way directional flow. Horizontal multi-louvre valve blades regulate up-and-down flow, and indicator on face shows position of these blades. Vertical grille bars are easily adjustable for straight or sideway deflection with turning tool. A register of superb appearance the Airo-Flex is a simply designed, carefully built, moderately priced model without frills or gadgets, which gives you all adjustable features of many more expensive registers. It is furnished for wall or baseboard installation with intake to match.

Many other types of Auer registers for both air conditioning and gravity systems shown in Auer Register Book, sent on request. For flat stamped metal grilles, ask for Grille Catalog.



Back view of Airo-Flex No. 4432 Register

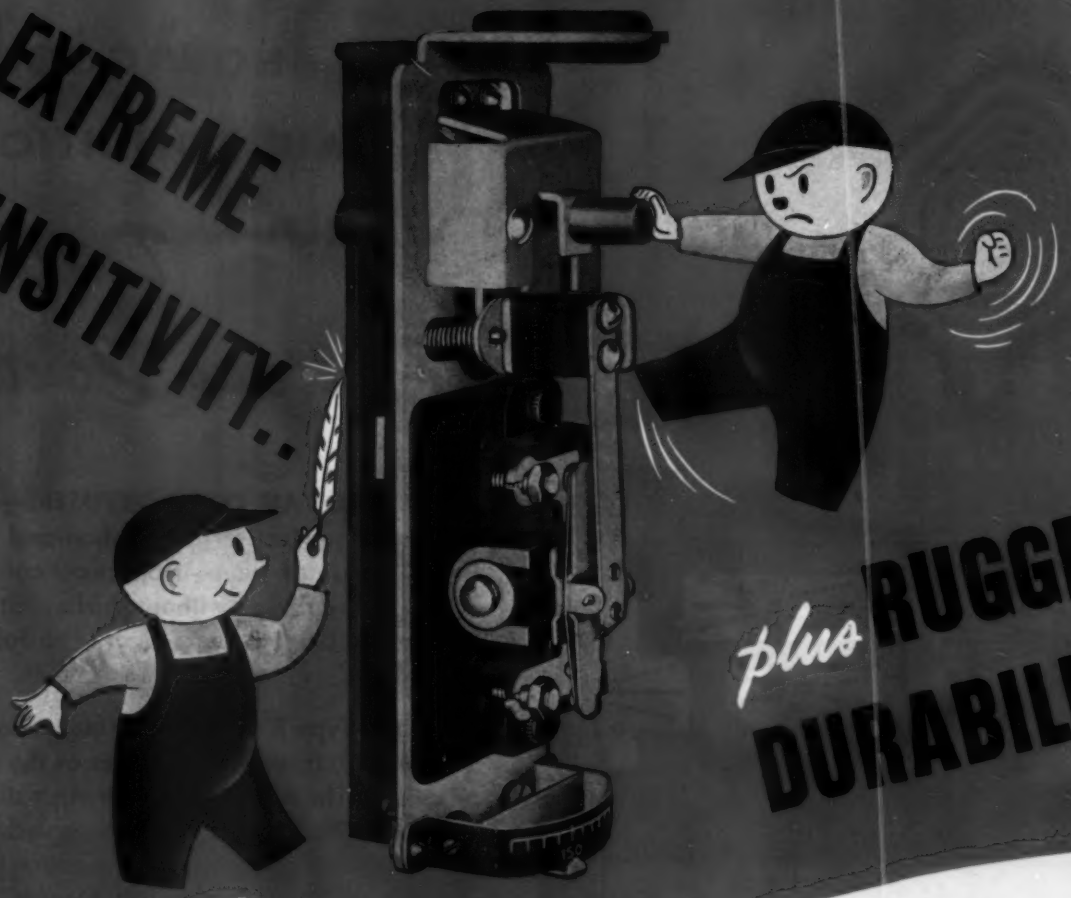
THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS

& GRILLES for AIR CONDITIONING & GRAVITY

Twin Contact Controls

EXTREME SENSITIVITY..



plus RUGGED DURABILITY

PERFEX *Exclusive*
TWIN CONTACT MECHANISM PROVIDES THESE UNEQUALLED ADVANTAGES

- **POSITIVE CONTACT** — Assures longer life, no sticking or pitting
- **MAGNETIC ACCELERATION** — Closes contacts by snap action.
- **LEVER ACTION** — With spring tension opens contacts cleanly and quickly.
- **WIPING ACTION** — Assures clean contacts.
- **NO FLEXIBLE LEADS** — Prevents short circuits and interference with mechanism.
- **HIGH SENSITIVITY** — Instantly responsive, yet ruggedly built.
- **IMMUNE TO VIBRATION** — Satisfactory operation even under abnormal vibration.

Instantly responsive Twin Contact Controls, for automatic heating units, are sensitive precision instruments. The slightest thermal or electrical stimulus produces an immediate reaction . . . a feature that reduces fuel waste and overheating caused by sluggish controls.

Highly sensitive yet ruggedly constructed, Perfex Controls are built to give years of continuous service. In every detail—in design—in construction—in performance, Perfex Controls have established their superiority in the field of automatic heating.

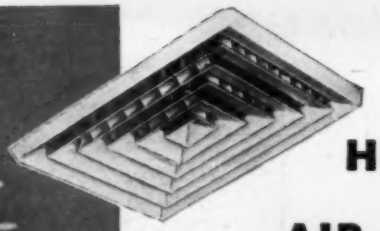
Today, more leading heating manufacturers prefer Twin Contact Controls than ever before. They know *pre*-selected Perfex Controls, sold under their established trade name, means better dealer relations and greater customer satisfaction.

PERFEX CORPORATION, MILWAUKEE 7, WIS. • PERFEX CONTROLS LTD., TORONTO, ONT.

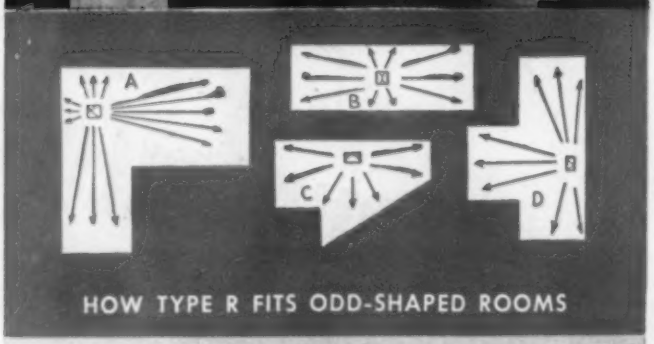
PERFEX

TWIN CONTACT CONTROLS

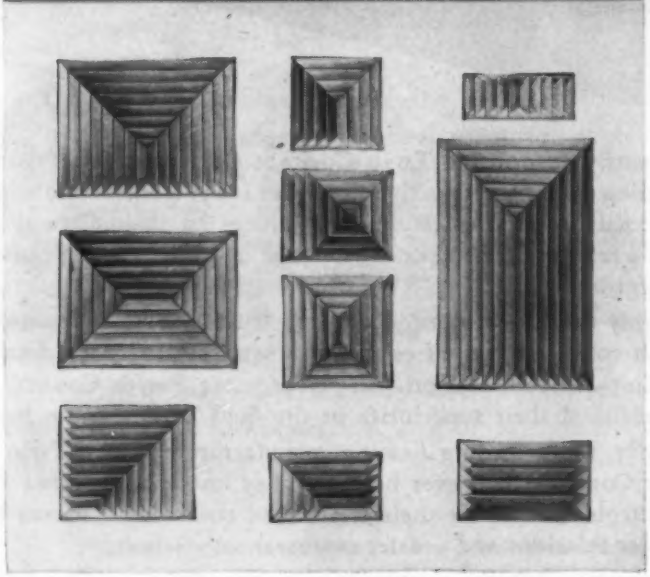
MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES



HOW GOOD IS AIR CONDITIONING WITHOUT *Diffusion Pattern Control?*



HOW TYPE R FITS ODD-SHAPED ROOMS



WITH AGITAIR TYPE R DIFFUSERS you can now achieve perfect air distribution and diffusion in any shape of room—from practically any location in the room—without drafts, hot spots, cold spots, or blank corners. That's "diffusion pattern control."

Agitair Type R's diffuse the incoming air toward one, two, three, or four sides of the room as required. The volume of air in each direction is in exact proportion to the area served. 64 venturi-type, noiseless orifices per square foot rapidly dissipate temperature differential and initial velocity.

Why worry about the ceiling center?

It's easy to provide perfect diffusion from any point in the room simply by selecting off-center, side-wall, or even baseboard patterns of the Type R.

There's an Agitair for every room and every condition

Assembled from standard parts, even the most complicated Type R shapes are economical. Ideal for low head-room. Write today for complete facts.

AT KEY POINTS IN AIR CONDITIONING—AGITAIR SERVES BEST

AIR DEVICES, INC. · 17 EAST 42nd STREET · NEW YORK 17, N. Y.

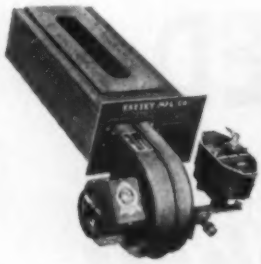
Built to be INSTALLED and then FORGOTTEN

NO MATTER which of the controls in the complete White-Rodgers line you use, their many exclusive features are designed to relieve you of any future attention. Years of satisfactory service have proved the dependability of White-Rodgers Hydraulic-Action controls.

WHITE-RODGERS ELECTRIC CO.
ST. LOUIS 6, MISSOURI
Controls for Refrigeration • Heating • Air Conditioning

The Outlook for . . .

KRESKY DEALERS



OIL BURNERS

Unique among oil burners, Kresky burns a long flame with mechanical air induction producing quick, clean, intensive heat at low cost. Simple in design—trouble free in operation. In use throughout the world.

FLOOR FURNACES

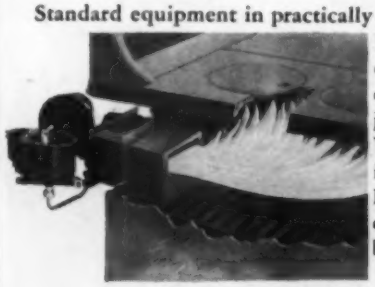
Originators of the oil burning floor furnace KRESKY is the only oil-fired floor furnace with forced air circulation bearing the Underwriters' label. Dual-wall or floor register. Manual or thermostatic control. Requires only 30" clearance. Four sizes . . . easily installed.

FURNACE UNITS

Now restricted in production due to material shortages, the Kresky line of oil-fired furnaces for central heating includes various types covering practically all the requirements for small homes.

RANGE BURNERS

Standard equipment in practically all leading ranges, Kresky range burners, both commercial and domestic, enjoy steady demand. With the new Horizontal Domestic Burner, oil, fuel or rubbish can be burned.



Right now is a good time for dealers to look ahead to be sure of being in on the ground floor for future oil burner profits. We suggest you take a look ahead with Kresky, a pioneer among oil burners with a third of a century of successful performance behind it. ★ Burning a long flame with mechanical air induction Kresky provides quick, clean, dependable, intensive heat at low cost. Simple in design . . . trouble-free in operation. ★ Right now Kresky burners are in greater demand than ever before with a tremendous backlog of orders. With enlarged plant facilities under way however, Kresky is looking ahead . . . invites live dealers to look ahead with us. Write for details of Kresky attractive Dealer Merchandising Plan.

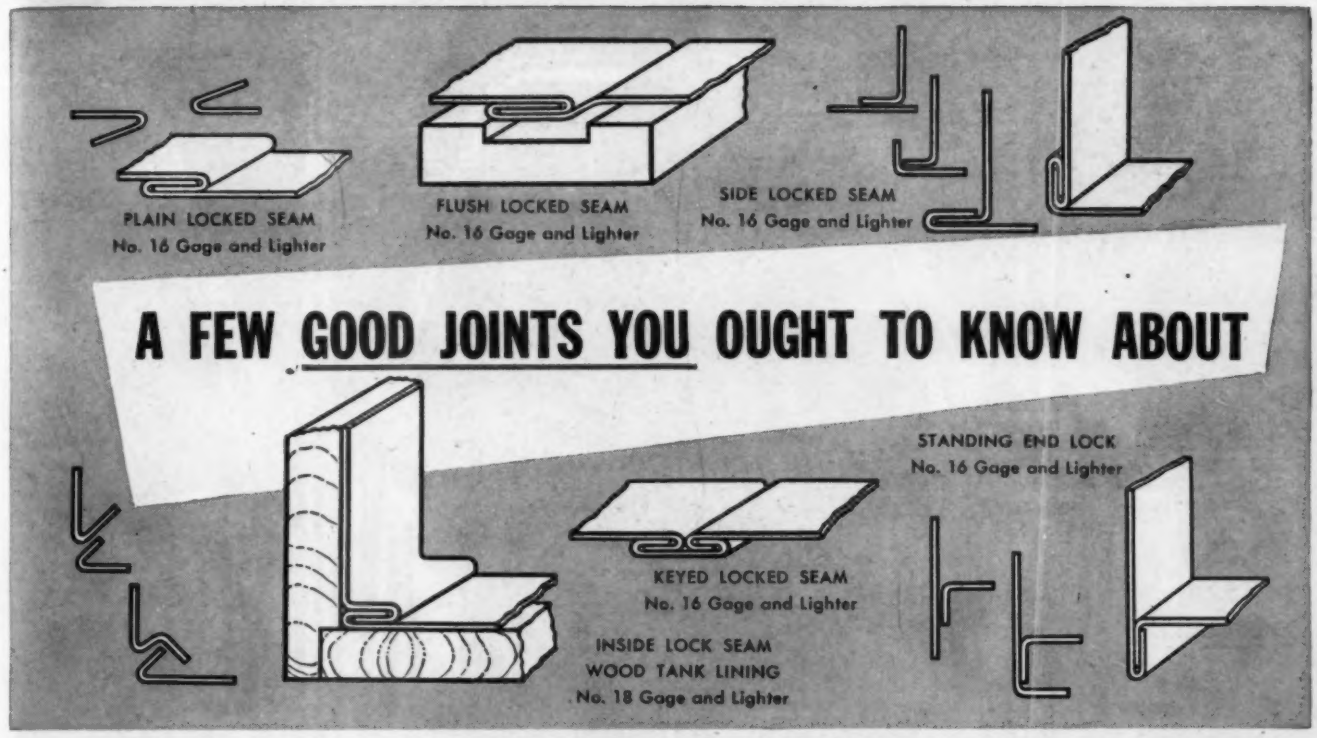
Listed by Underwriters' Laboratories, Inc. To Burn No. 3 Oil (Diesel) or lighter

Kresky Oil BURNERS

KRESKY MANUFACTURING COMPANY

Pioneers in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA


PLAIN LOCKED SEAM
No. 16 Gage and Lighter
FLUSH LOCKED SEAM
No. 16 Gage and Lighter
SIDE LOCKED SEAM
No. 16 Gage and Lighter
A FEW GOOD JOINTS YOU OUGHT TO KNOW ABOUT
STANDING END LOCK
No. 16 Gage and Lighter
KEYED LOCKED SEAM
No. 16 Gage and Lighter
INSIDE LOCK SEAM
WOOD TANK LINING
No. 18 Gage and Lighter

—if you're working with Stainless Steel

THESE joints and many more, as well as various types of corners and edge reinforcements that have proved most practical in the application of Stainless Steel, are shown and described in detail in our new book, *"The Fabrication of U·S·S Stainless and Heat Resisting Steels"*.

Here in handy, practical form is the very latest information on this important subject. Written from the point of view of the man who actually works with the steel, and who wants to do the best job possible, it covers every phase of fabrication, answers all the questions that you will ask in putting U·S·S Stainless into use.

It describes the recommended procedure for drawing, forming, spinning, welding, soldering and finishing. It shows how to get best results in cutting, punching, shearing and perforating. It will help you select the correct grade and finish of U·S·S Stainless Steel to best suit your needs.

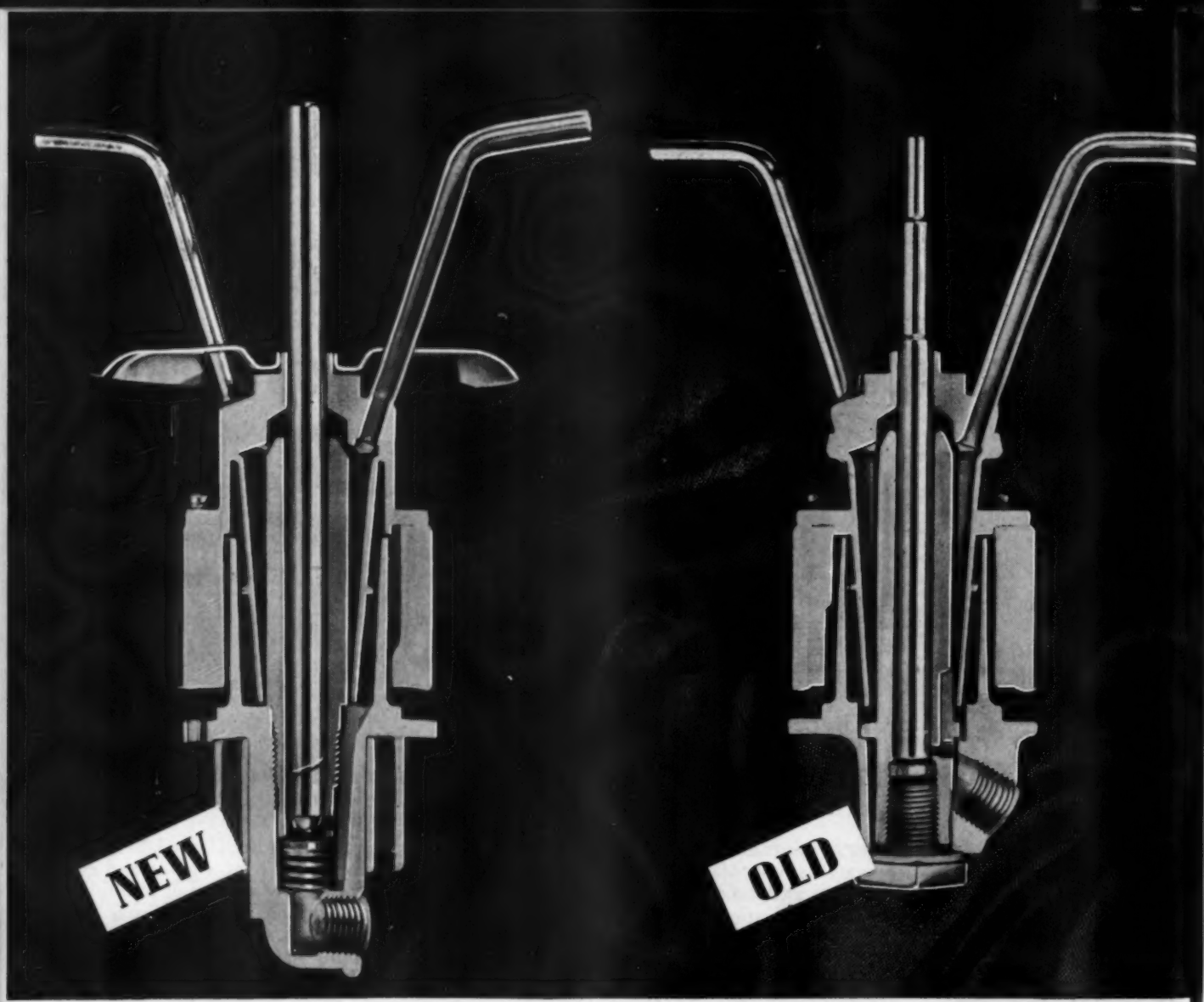
This book has just been issued. Send for your free copy. Use it as a guide and get your share of the big volume of profitable business in Stainless Steel waiting for someone to handle. Don't pass it up because you think Stainless is hard to work. Actually fabricating with U·S·S Stainless Steel is not much different than working with other steels—nor does it require a lot of special, expensive equipment. If you need further help, our stainless steel experts will be glad to give you the benefit of their long experience. Their cooperation puts you under no obligation.

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL



How many oil burner improvements can you find in this picture?

We won't describe them here, but there are six improvements in the Timken Mono-Rotor alone. Thirteen others are found elsewhere in the new Timken Silent Automatic Wall-Flame Oil Burner*.

Each of these improvements adds to Timken economy and dependability. Each is a further reason why Timken Silent Automatic Oil Burners are easier to sell . . . easier to install and service . . . more profitable to handle.

Today more than ever before, *sound engineering* is important to both buyer and seller of oil heating equipment. The 20 years of concentrated oil heating experience back of Timken Products, and the unparalleled record they established during the war years, go far to explain why Timken is "The Accepted Standard" wherever quality oil heating equipment is sold.

**All 19 Timken postwar improvements are described in detail in the February TIMKEN HEAT magazine. A free copy will be sent you on request.*

TIMKEN
Silent Automatic
HEAT

TIMKEN SILENT AUTOMATIC DIVISION
THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICH.

The Accepted TIMKEN HEAT Standard

NOTE: When installed with super-sensitive thermostats for shorter, more frequent operating cycles, the fast warm-up of Timken Wall-Flame Oil Burners is a feature of particular advantage. Write for complete information.

See New Postwar Timken Equipment at O. H. I. Exposition, Philadelphia, April 23-27

ANNOUNCING

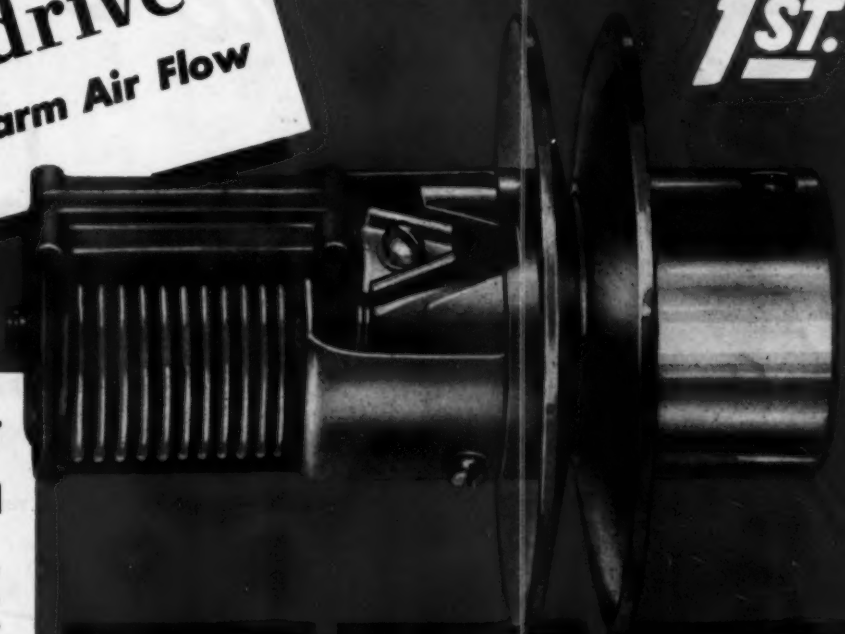
WEBSTER ELECTRIC

Thermodrive

for Control of Warm Air Flow

Another

WEBSTER ELECTRIC 1ST.



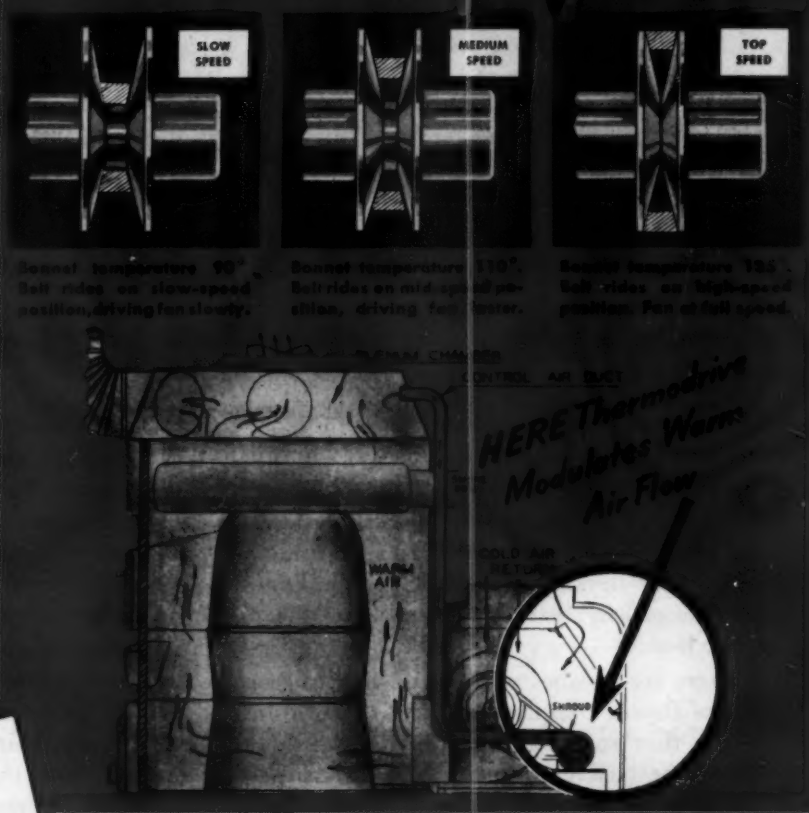
FOR NEW EQUIPMENT OR FOR CONVERSION

Thermodrive is designed to increase and decrease speed of the fan in a forced warm air heating system so as to give more even room temperatures, along with more economical heating performance.

Thermodrive automatically increases fan speed as bonnet temperature increases. Speed change can be as much as 65 percent from low to high. The off-cycle operation is reversed, and fan continues at decreasing speeds until cut-out temperature on bonnet control is reached.

A warm air "sample" is continuously drawn from the plenum chamber and blown over a thermostatic bellows, which in turn actuates a sliding sheave of a split pulley. This changes its effective diameter and results in either increased or decreased speed of the fan.

Years of experience in making products for the heating field are responsible for this latest Webster Electric development in the control of warm air heat.



See It Demonstrated for First Time at Booth No. 430 NATIONAL OIL HEAT EXPOSITION PHILADELPHIA, APRIL 23-27

WEBSTER ELECTRIC

RACINE WISCONSIN

"Where Quality is a Responsibility and Fair Dealing an Obligation"

Sure, they're SOLD ON bryant GAS HEATING

LET THE PUP BE FURNACE MAN

. . . and national advertising, plus the greatest array ever of selling materials for dealers will help keep Bryant the best-known, most-preferred gas heating equipment!

You probably have met them . . . the folks who are so sold on Bryant that they are going to wait and hope a few months longer.

Yes, there are thousands of them. There are homeowners who plan modernization and want the famed Bryant conversion burner or the popular gravity warm-air furnace or the new water heater.

There are families who would like to be certain of Bryant complete winter air conditioning before they start building their dream homes. There are businessmen and industrialists, too, who look forward to the day when they can get Bryant equipment for their stores and factories.

Steadily, the flow of Bryant products is on the increase. Two plants in Cleveland now are in production. Construction of the new Bryant Heater plant at Tyler, Texas is proceeding rapidly—with production of gas-fired water heaters scheduled to begin early in July.

Barring unpredictable events, it appears that many of these folks who are pre-sold on Bryant, who have waited patiently for their equipment, will see their hopes fulfilled this summer. And, we believe that you will be mighty happy to tell them . . . *"your Bryant is here!"*

BRYANT HEATER COMPANY, 17825 St. Clair Avenue, Cleveland 10, Ohio

One of the Dresser Industries

The most complete line of gas heating equipment in the nation!

TESTED TRIO

OF *Quiet* PERFORMERS

ONE-PIECE STEEL HOUSING PILLOW BLOCK. Either Single or Double Oil Reservoir.

NEW STREAMLINED ONE-PIECE STEEL HOUSING PILLOW BLOCK. Either single or double oil reservoir.

STANDARD PILLOW BLOCK. Single oil reservoir.

THEY'RE

Randall

SELF-LUBRICATING, SELF-ALIGNING

PILLOW BLOCKS

Favorites of the men who design and build the nation's furnace blowers and air conditioning units, this trio of tried and tested pillow blocks efficiently meets your air handling needs.

Behind their silent, trouble-free operation lies more than thirty years of leadership in building graphite bearings.

Self-aligning and self-lubricating, these quality pillow blocks deliver the maximum in quiet, economical dependability. Built for a lifetime service with a minimum of attention.

For assistance in finding a *quiet*, customer-pleasing solution to your bearing problems consult with Randall engineers. They'll be glad to explain the advantages of every unit in the complete line of Randall Pillow Blocks. A copy of our catalog No. 42 is yours for the asking. Write for it today.

Representatives Carrying Stocks

C. W. Marwedel
San Francisco, Calif.

Tek Bearing Company
177 Lafayette, New York 13, N. Y.
510 Cambridge St., Boston 34, Mass.

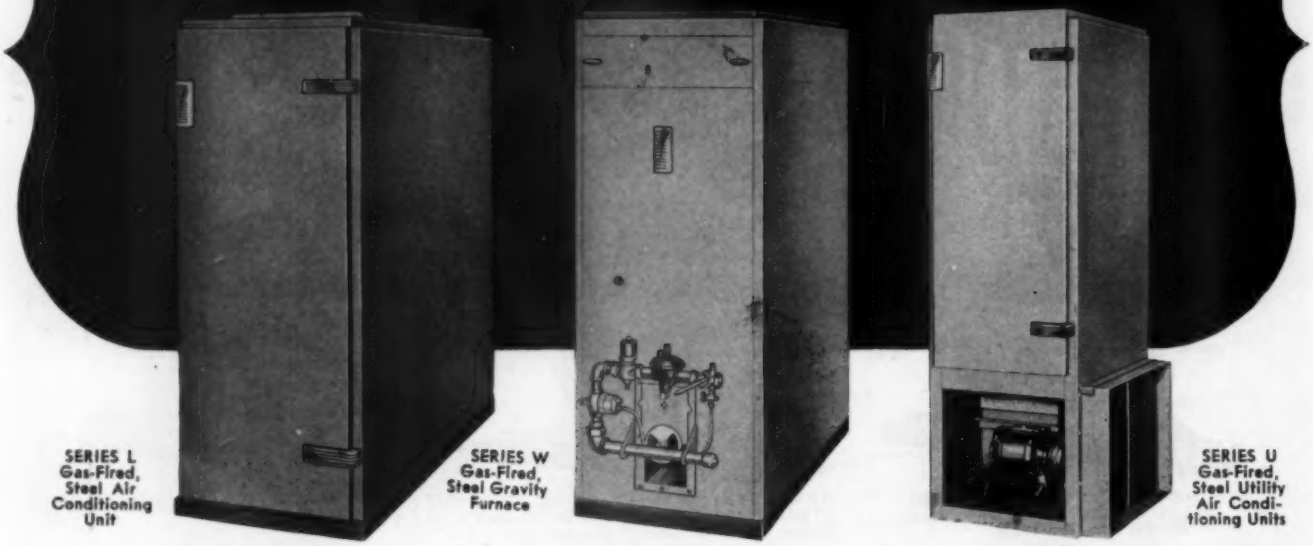
Salt Lake Hardware Co.
Salt Lake City, Utah

Edward D. Maltby Company
1718 Flower Street
Los Angeles 15, Calif.

RANDALL GRAPHITE PRODUCTS CORPORATION

Dept. 411 — 609 W. Lake Street — Chicago 6, Illinois

It's Easier to sell MONCRIEF than Compete with it!



SERIES L
Gas-Fired,
Steel Air
Conditioning
Unit

SERIES W
Gas-Fired,
Steel Gravity
Furnace

SERIES U
Gas-Fired,
Steel Utility
Air Condi-
tioning Units

It's the distinctive features . . . attractive appearance . . . easy assembly . . . economical performance . . . and longer life . . . that place Moncrief's 1946 line "years ahead" in gas furnace design.

Moncrief gas units are new 1946 models that have passed the latest exacting tests of the A.G.A. and are fully approved.

Then, too, Moncrief has had more than 50 years' experience in the heating field—a "know-how" that enables Moncrief to keep ahead in experimenting. testing and designing.

And the Moncrief dealer organization stretches far and wide. The needs and problems of dealers are part of the Moncrief "know-how."

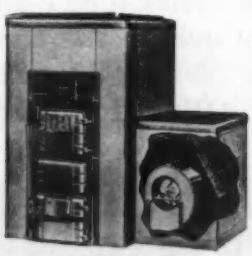
Briefly, this is why it is easier to sell *with* Moncrief than to sell *against* it.

Easier to Install
Easier to Service
Easier to Sell

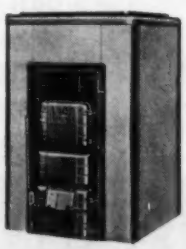
MONCRIEF
SINCE 1895

THE HENRY FURNACE CO.
MEDINA, OHIO

SERIES 8000
Oil-Fired, Steel Air
Conditioning Unit



SERIES AC-700
Coal-Fired, Steel Air
Conditioning Unit



SERIES 700
Coal-Fired, Steel Gravity
Furnace

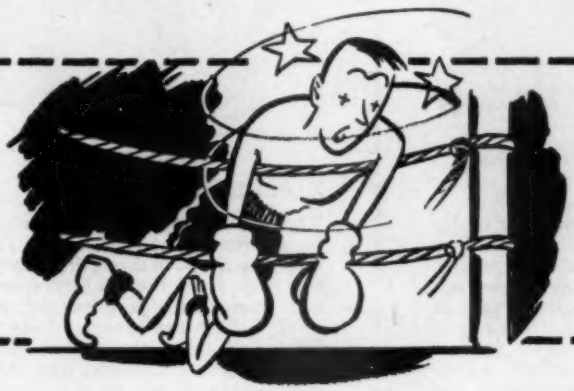
SERIES C
Coal-Fired, Cast Gravity
Furnace

MAKE MONEY and SELL SATISFACTION installing STAINLESS roof drainage

When new construction and remodeling gets under way, you'll find some interesting and profitable opportunities to use ARMCO Stainless Steel for roof drainage systems —and even certain types of small roofs.

REMIND THE ARCHITECT: True, you'll have to "pick your spots" for this premium metal—and in some cases you'll be the one to suggest it to the architect—but you'll find the effort well worthwhile.

The grade of ARMCO Stainless recommended for gutters, downspouts and related work has a soft, silvery color. It blends well with surrounding construction and does not "frame" the structure.



RESISTS CRACKING, SAGGING: Stainless steel is one of the strongest of all metals and, when properly installed, resists cracking caused by extreme temperature changes. It also has a high elastic limit, which enables it to withstand sagging much better than softer, weaker materials.

EASY TO WORK: Workability of 28 gage Type 301 ARMCO Stainless Steel is about the same as that of 26 gage galvanized steel. Experienced sheet metal men have no trouble in forming stainless steel and no special equipment is needed.

LASTS LIFE OF HOUSE: You can assure your customers that ARMCO Stainless Steel, being a solid, rustless metal, is a wise investment in extra-durable roof drainage. While the initial cost is naturally higher than for less durable materials, this is more than offset by added years of trouble-free service.

WRITE FOR FREE COPY of the booklet, "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories." The American Rolling Mill Company, 1191 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation.

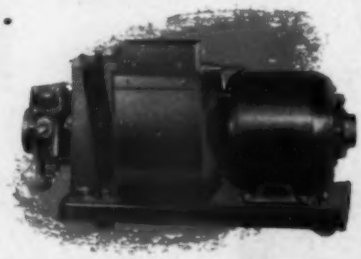
The American Rolling Mill Company

The New Gar Wood Oil-Fir
has the outstanding, easy-to

Remember... Gar Wood is the original oil-fired burner un

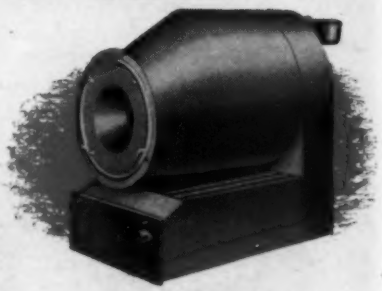
Combustion Chamber Firing Unit

The burner and fire bowl combustion chamber are built as one unit. The end of the fire bowl forms a windbox containing air for combustion at sufficient pressure to offset the effect of draft variations. Air from the windbox passes through metering chutes, set at an angle to cause rotation. Oil and air rotate and intermingle in a definitely controlled conical spray.



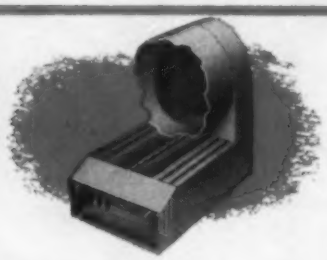
The Power Unit

The power unit supplies air under pressure to the burner windbox and also maintains a definite controlled oil pressure in the burner fuel nozzle. This assures a perfect mixture of oil and air. All parts are die-formed and welded into a single rigid unit. The entire assembly is rubber-mounted for silent operation and can easily be removed should servicing be required.



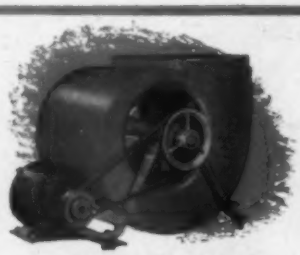
Firebox-Economizer Unit

The firebox and the economizer form one composite unit. The teardrop shape of this unit removes the peak from the high temperature zone and permits the air sweeping up the furnace sides to follow clear to the top thereby absorbing a maximum of heat. The elimination of hot spots plus the exceptionally sturdy construction assures a long life of trouble-free performance.



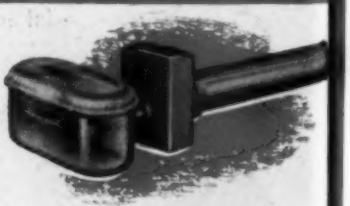
The Economizer

The combustion chamber has its outlet at the bottom through which the hot gases pass down into the economizer. Here the gases divide into long thin slices within the economizer tubes. Each tube is swept at high velocity by cold return air from the blower. The rapidly flowing cold air absorbs a maximum of heat from the economizer surfaces before it contacts the hotter firebox.



Efficient, Rubber-Mounted Air Blower

1. Shaft mounted on self-aligning ball bearings set in rubber pillow blocks.
2. Belt tension automatically regulated by weight of motor.
3. Large lightweight blower wheel operating at slow speeds for quietness and economy.
4. Adjustable pulley to permit exact setting of blower speed.
5. Discharge outlet connected through canvas connector.



Flash Humidifier

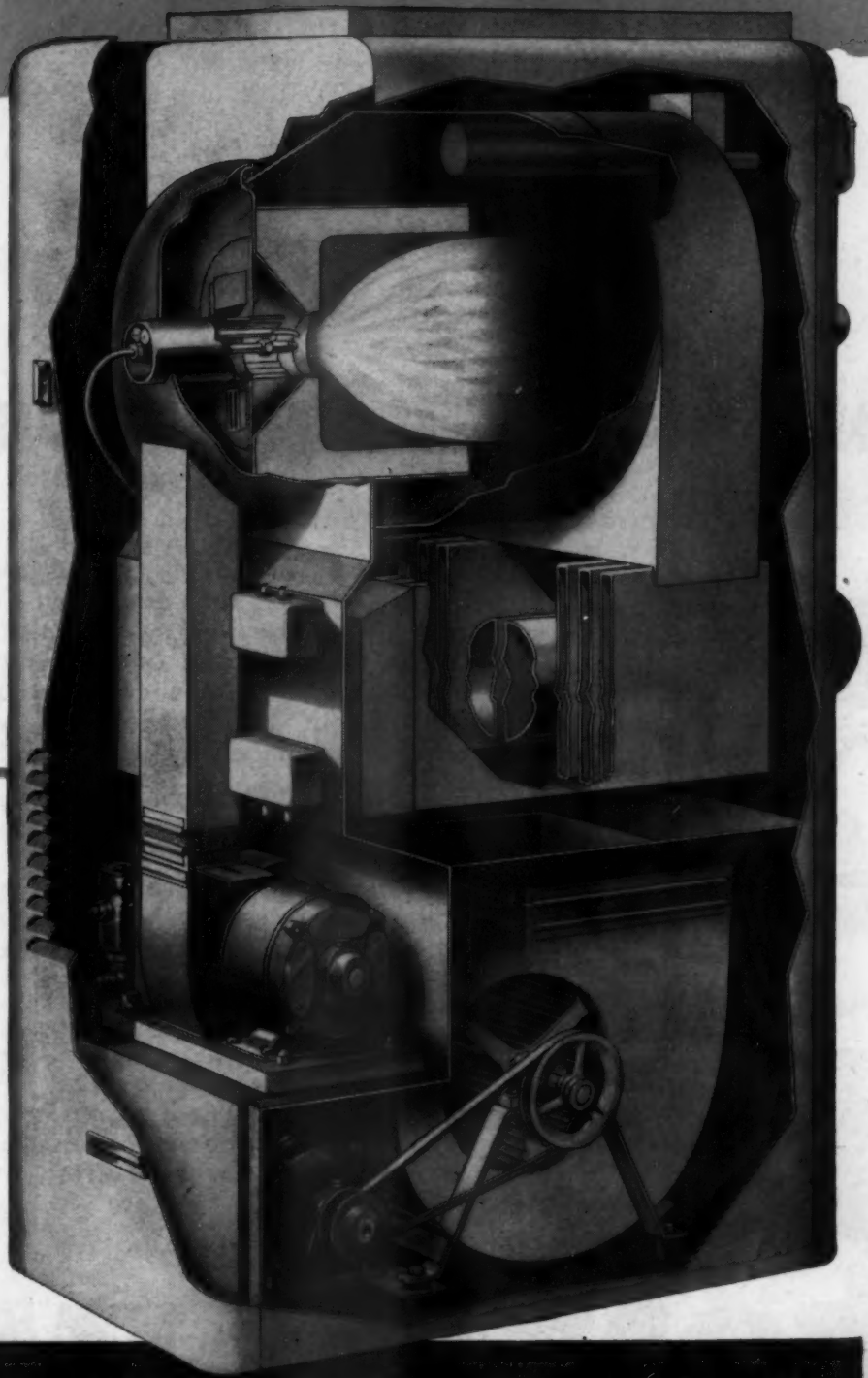
A miniature flash steam boiler within the furnace firebox goes into action when the burner starts. This type overcomes the shortcomings of the slow heating, evaporating pan type of humidifier. Adequate humidity is delivered into the house under the difficult conditions imposed by the short firing cycles resulting from the use of modern, heat accelerated thermostats.

GAR WOOD INDUSTRIES, INC., HEATIN

HOISTS AND BODIES • WINCHES AND CRANES • TANKS

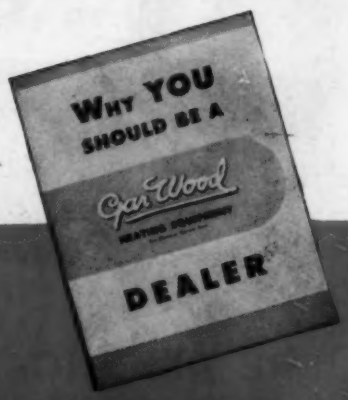
TEMPERED-AIRE

sell features for 1946



THE principles of Tempered-Aire differ from those of any other heating unit. The reason for this dates back to 1927, when Gar Wood developed the first furnace-burner unit. After exhaustive research and effort, a complete, coordinated heating unit was perfected that was not the easiest or most inexpensive to manufacture, but it did incorporate every desired quality skillfully engineered to attain the highest level of performance. Each part that goes into the making of the complete Tempered-Aire Heating Unit has been designed to perform its particular job in the most efficient manner and to function in perfect coordination with all related parts. This is your assurance of dependable, balanced, easy-to-sell heating performance.

This advertisement describes postwar equipment which is not now available. It does not constitute an offer to sell or deliver and no suggestion is made that orders be solicited. This notice will cease to apply when ceiling prices have been established by the O.P.A.

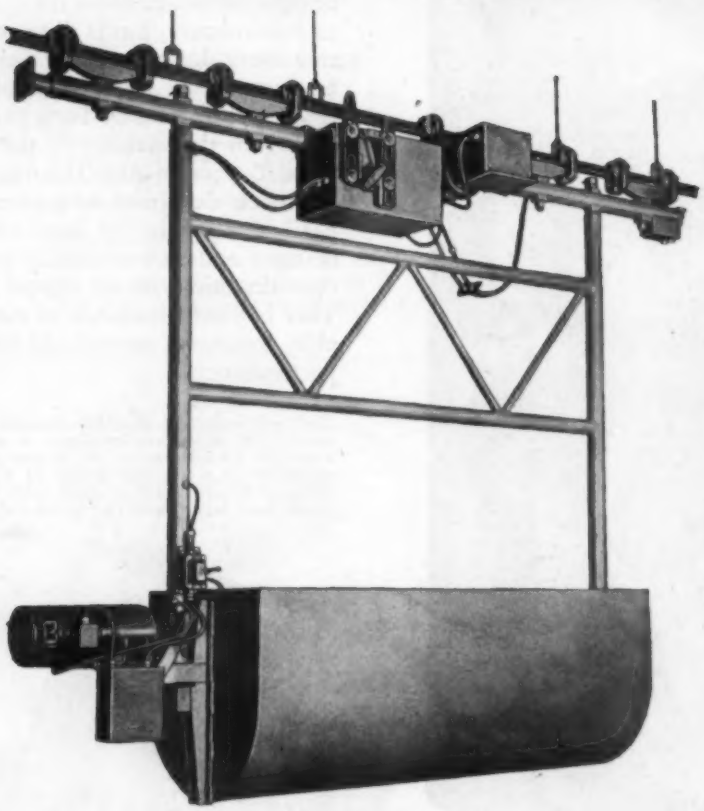


Write Today For This Informative, Free Booklet

DIVISION • DETROIT 11, MICHIGAN

ROAD MACHINERY • MOTOR BOATS

10 Years of Automatic Operation



AUTOMATIC handling is not new with American MonoRail. This system has been in operation over 10 years. Since the original system was installed, two additional automatic carriers have been added. It has been continuously operated day-in and day-out with remarkably few replacement parts.

The automatic dumping bucket carries a cubic yard — travels to movable stop at 150 f.p.m.— dumps automatically — returns to loading station at 400 f.p.m. Movable stops are set to where material should be dumped. The carrier does all the dumping after being loaded and dispatched from the loading station.

Whatever your handling problem may be, there's an American MonoRail System best suited to your individual needs. Consultation in connection with any handling problem is available without obligation.

THE AMERICAN MONORAIL COMPANY

13133 ATHENS AVENUE CLEVELAND 7, OHIO

CHRYSLER AIRTEMP

The Sign of Year 'Round Dealer Profits

There's a real opportunity for year 'round dealer profits with the Chrysler Airtemp triple line of products. Agreements are written for one, any two, or all three lines.

The heating line is the most complete and advanced on the market. It includes automatic central heating for homes of all sizes. There are gas, oil and coal-fired models, furnaces and boilers; a combination heating and cooling system for all-year air conditioning; domestic stokers, conversion oil burners and water heaters.

The modern air conditioning products are head and shoulders above the field. They are the famous "Packaged" Air Conditioners, pioneered by Chrysler Airtemp. In refrigeration, Chrysler Airtemp presents products for every commercial and industrial requirement.

Behind these products stands Chrysler Corporation with its reputation for engineering and mass production skill —assurance of high quality at low cost. It will pay you to investigate; Airtemp Division, Chrysler Corp., Dayton 1, O. In Canada: Therm-O-Rite Products, Ltd., Toronto.

1, any 2, or all 3

Chrysler Airtemp dealer agreements provide dealers year 'round profit opportunities. They call for 1, any 2, or all 3 product lines.

"REMEMBER THURSDAY NIGHT! The music of Andre Kostelanetz and the musical world's most popular stars—Thursdays, CBS, 9 P.M., E.S.T."

MEMBER I.C.I. INSTITUTE OF CLIMATIC INVENTIONS

AIR CONDITIONING
HEATING • COOLING • REFRIGERATION

YOU CAN READILY SEE from this illustration why Anaconda Through-Wall Flashing is known as "the flashing that drains itself dry on a level bed." The die-stamped dam and corrugations provide positive drainage in the desired direction, intercepting and disposing of wind-driven rain and moisture penetrating the masonry.

Equally evident is the fact that this preformed flashing is easy to install. Because of the flat selvage, sharp bends for counter flashing, or for locking to adjacent metal, are easily made. And merely by nesting one or two corrugations, Anaconda Through-Wall Flashing is readily locked endwise to form water-tight joints.

The photograph below shows the Grafton, West Virginia, High School, in which this durable, rustproof flashing provides positive protection against seepage, and decreases the risk of heaving by frost.

For detailed information on Anaconda Through-Wall Flashing, write for Publication C-28.

Sure protection... Easy installation

with ANACONDA THROUGH-WALL FLASHING

• *Grafton, W. Va., High School, equipped with Anaconda Through-Wall Flashing. Carleton Wood, Clarksburg, W. Va., Architect; Fuel City Metal Works, Clarksburg, W. Va., Sheet Metal Contractor.*

ANACONDA

Anaconda

COPPER

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

ON TIME!

FOR THE GI HOMES PROGRAM

The

MOR-SUN

UTILITY MODEL U-4-G

Suitable for use in the restricted space of utility rooms... yet not too high for basement installations... Vent, enclosed burner, blower access door and filters all available from the front of unit, allowing installation in closets of homes or apartments.

One piece welded construction. Simple, rugged, the U-4-G has no baffles, reverse flue travels nor dirt or condensation traps. Available May 15. (Dependent on availability of material).

MORRISON
STEEL PRODUCTS, INC.
BUFFALO 7, N. Y.

"The Sun Never Sets with MOR-SUN!"

A. E. Mayer of St. Louis, Mo.

Installed Herman Nelson U

AMP CORPORATION, St. Louis, Mo.
BERT LUER, Architect, St. Louis, Mo.
G. E. HORCH, Engineer, St. Louis, Mo.
A. E. MAYER PLUMBING & HEATING CO.
Heating Contractor, St. Louis, Mo.

Herman Nelson Vertical Shaft Propeller-Fan Type Unit Heaters

Herman Nelson Horizontal Shaft Propeller-Fan Type Unit Heaters

TYPICAL of the hundreds of outstanding plants in which Herman Nelson Products have recently been installed is this new factory of the Amp Corporation in St. Louis, Mo. The firm manufactures drink dispensers, refrigerated carbonators, refrigeration control valves and other products.

During the past 40 years, Heating Contractors have learned they can install Herman Nelson Equipment with confidence. Actual experience on thousands of installations has proved to them conclusively that . . . whether a job calls for unit heaters, unit ventilators, propeller or centrifugal fans . . . it's impossible to find better products than those bearing the Herman Nelson nameplate.

There's another important angle. Herman Nelson's nationwide distributor organization is qualified to provide you with practical as well as technical assistance. If, because of heavy demands for our products, your nearest Herman Nelson Distributor may not have in stock the exact equipment you need for a job, he will receive our full cooperation in supplying you as rapidly as possible.

herman nelson

THE HERMAN NELSON CORPORATION

for 40 years manufacturers of quality heating and ventilating products

MOLINE, ILLINOIS

n Unit Heaters on this job

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e Elizabeth, Me.—The Partridge Co.
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Leavenworth, Kan.
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Trimble & Lutz Supply Co.
Wheeling, W. Va.
Geo. E. Trudel Co.
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Oklahoma City, Okla., and Omaha, Neb.
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Wausau, Wis.
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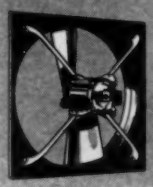


Herman Nelson Direct Drive Propeller Fans

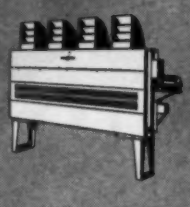
Herman Nelson Belt Drive Propeller Fans

Herman Nelson Horizontal Shaft Propeller-Fan Type Unit Heaters

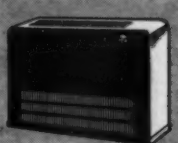
Herman Nelson Type H Centrifugal Fans

Herman Nelson Vertical Shaft Propeller-Fan Type Unit Heaters

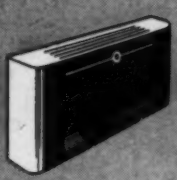
Herman Nelson Type HB Centrifugal Fans



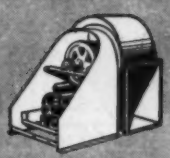
Herman Nelson Blower-Fan Type Unit Heaters



Herman Nelson De Luxe Unit Heaters



Herman Nelson Unit Ventilators

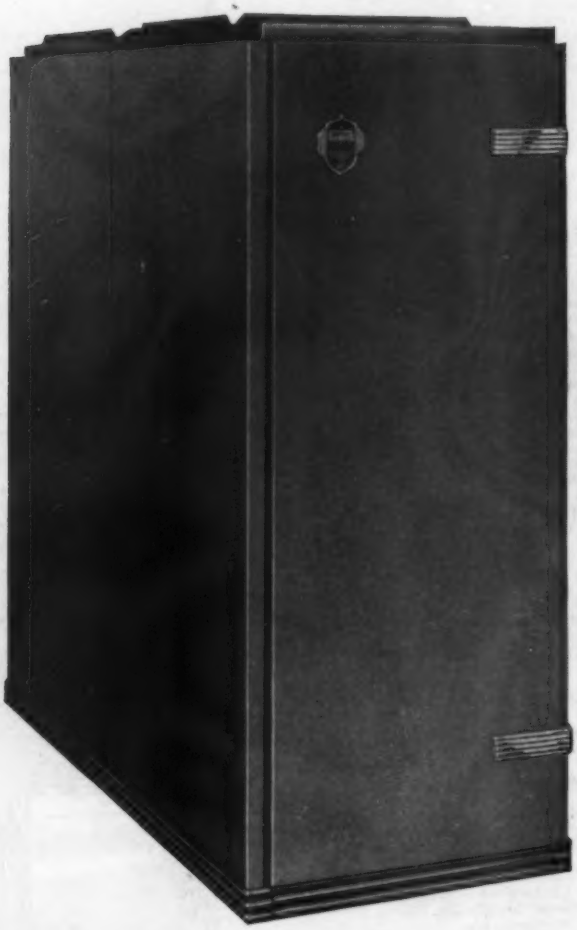


Herman Nelson Belt Drive Unit Blowers

Herman Nelson Direct Drive Unit Blowers

HERE'S THE GLAMOROUS NEW

Toridheet OIL FIRED PACKAGED UNIT



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You can see at a glance it is the clean-cut, smart, beautiful, modern unit you'd expect from Toridheet. Its eye-appeal is high — its cabinet is practical, well made, substantial, offering the maximum in accessibility, cleanliness and easy set-up. It's got everything that insures swift sales and dependable service.

And it's equipped with the most modern and efficient of tubular type radiators; its ratings are guaranteed.

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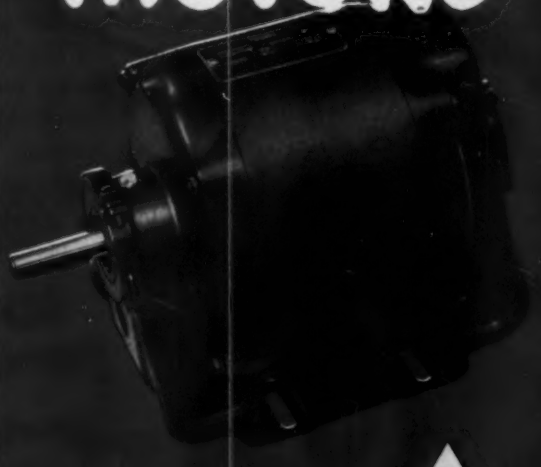

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Power America's Leading Appliances

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DAYTON, OHIO

You'll do a whale of a lot better with Delco motors . . . if you want your appliances to have the best in modern, smooth-running and dependable drives.

For years, Delco motors designed for the specific application have powered leading makes of refrigerators, washers, ironers, stokers, oil burners, air conditioners and other appliances. This invaluable background of experience is reflected in the compactness, efficiency and dependability of the Delco motors now available to the appliance industry. Delco Products Division, General Motors Corporation, Dayton, Ohio.

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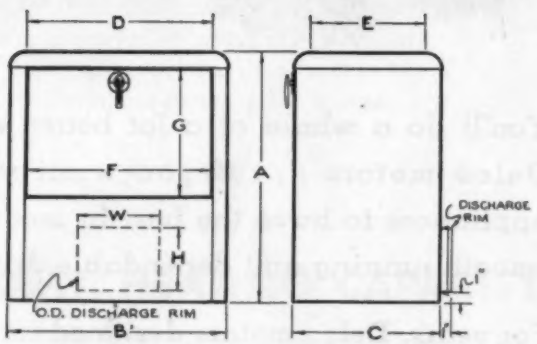
The New LAU Series "A" Blower Assembly—the most advanced unit ever offered on the market—is now used in the LAU Blo-Ette Package Unit (400-A Series). The Series "A" Blower Assembly includes the new LAU center suspension Spun-lok wheel which we have PROVED is far superior to other types of wheel construction. Each deep, scientifically pitched blade is a driven blade mechanically locked to the center disc. Narrower end ring and the new 3-point suspension-method bearing bracket combine to lessen obstruction of air flow into the wheel. Overall size of assembly considerably smaller than formerly. Numerous other features. Gives you a package unit in the LAU Blo-Ette which has no equal in performance—no equal in saleability. Write for complete description, performance data, and prices.



DIMENSIONS FOR 400-A — 406-A BLO-ETTES

MODEL	A	B	C	D	E	F	G	Discharge Rim H	Discharge Rim W
400-A*	30	24	25	24⅛	25⅛	20⅜	27⅜	11⅜	12¾
401-A	34	30	25	26	21	25 15/16	17⅜	12⅜	14⅜
403-A	40	33½	27	29½	23	29⅜	26⅜	14⅜	16⅜
404-A	42	33½	37	29½	33	29⅜	26⅜	16⅜	19⅜
405-A	42	33½	37	29½	33	29⅜	26⅜	16⅜	19⅜
406-A	42	33½	37	29½	33	29⅜	26⅜	16⅜	19⅜

* MODEL 400-A HAS SQUARE CORNERS; ALL OTHERS ROUND AS SHOWN

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DAYTON 7, OHIO, U. S. A.

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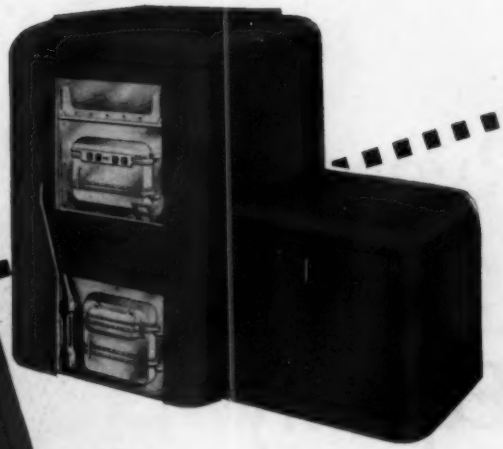

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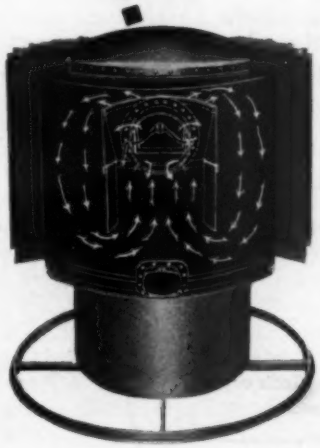
FINS

FINS SAVE FUEL!

Victor FINS supply 57¼ more square feet of heating surface than is provided by the ordinary 24 inch furnace. *More hot metal heats more air*—faster, on less fuel. An EXCLUSIVE feature of the Victor line.



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- ***RIGID,*** one piece base ring provides solid foundation for perfect alignment of all parts, with 1½ inch dead air space under ash pit.
- ***RUGGED*** boiler plate steel construction entirely welded and riveted, eliminates smoke leaks and keeps heat CLEAN.
- ***TRIPLE FLUE ECONOMIZER,*** or radiator, in Deluxe models, provides more effective fire travel; reduces loss of heat in chimney and smoke pipe . . . more *usable* heat from less fuel.
- ***AUTOMATIC DAMPER*** control in the Three-Flue Radiator provides direct draft when feed door is open. Closes by gravity when door is closed. Eliminates smoking through the feed door when fueling.

PLUS the exclusive, patented, Victor Heat Radiating FINS.

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- Mechanical Tubing
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- Tool Steel
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RYERSON STEEL

VHP-No. 1 Does Not Put You Out of Business

THERE just couldn't have been any greater force for confusion pitched into the general welter of construction reconversion than the so called veterans' housing program order, VHP-1.

The first reaction everywhere was: "This stops construction." The second reaction undoubtedly was: "This forces me to close up shop."

Now, about three weeks after the order was announced, Washington is trying to assure everyone and sundry that the order really didn't mean what it said.

AMERICAN ARTISAN makes no pretense of knowing all about the inside workings of Washington's mind. But in the last two weeks reports have been trickling in and contacts have been made with CPA-FHA and certain clarifying statements have been hurriedly issued from Washington. This gossip, statements, claims, etc., have been taken at their face values and woven into the report on VHP-1 which appears on the next few pages of this issue.

This report is not the full story—it likely will be two or three months before we finally know what's what. But in the report we have deliberately tried to point out any and all loopholes through which we may follow our normal business pursuits. To this extent the report is definitely more optimistic than the first reaction two weeks ago.

Don't get the idea we think VHP-1 has no meaning. Quite the contrary, AMERICAN ARTISAN believes this regulation is so loaded with trouble that if enforced to the letter of the regulation, the order can put a serious crimp in much of our profitable work.

There are several things about this order which lead us to believe that great relaxations must come.

First, as the order is written, priorities will be issued to builders for "critical" materials. The builder will pass these priorities to the sub-contractors. The sub-contractor will pass this priority back to the manufacturer or distributor. So far, so good. But when the priority reaches the distributor, it ceases to have influence or meaning. Nothing in the order grants priority assistance to the furnace manufacturer to help him get steel. Presumably there must be some idea in Washington's mind on this point, but help is not written into the order. Manufacturers tell us they are getting no assurance from steel mills and, further, the steel mills say there is no law which can force them to ship steel which they do not have or do not expect to produce.

Second, where does the 2,700,000 homes needed estimate come from? We've never been told how this total was built up or who made the survey (if any survey was ever made). Industry should get some reasonable assurance that the goal we are giving our shirts for is a real need.

Third, all early publicity gave the impression CPA meant 2,700,000 *single family houses.* It's quite in order, we think, to ask if 2,700,000 vets actually *want* a single family house. And can 2,700,000 vets actually *pay* for a house at the $6,000; $8,000; $10,000 set by Washington as the price of a house. Surely all these vets are not *permanently* settled in a job and a future and a community. It wouldn't be at all surprising to find that a very great percentage of these vets mean *flat* when they say, home.

Fourth, how can the construction industry know that there will be any uniformity in the CPA-FHA procedure in granting approval. Isn't it plausible that some offices will adhere to the letter of the law, while other offices will permit any and all building? Before an entire industry goes crazy, we should be assured everyone will be treated alike.

Fifth, gossip has it that the type of veteran house CPA visualizes may be all right for Florida, but can't be lived in north of the Ohio. We've been told CPA wants a house without basement, without gutters and downspouts, with a minimum of plumbing, heating, wiring, etc. It doesn't stand to reason that a vet is going to mortgage his future and make high payments just to get a "shack."

Sixth, it seems to us Washington is paying too much attention to the rosy "dreams" of folks like the prefab house boys. Undoubtedly pre-fabrication is coming, but these people who blithely announce they can produce 50,000 two-bedroom houses a year, each house 26 feet long by 8 feet wide, weight 6500 pounds, shipped on a truck, for $2,500 at the factory, assembled in idle war plants—if they get materials—are just muddying up the water.

This is a tremendous problem. It just can't be solved by well intentioned amateurs who ignore all established construction practice and actualities. It is a problem which can and will be solved only when the construction industry as a whole sits down and plans a realistic program.

Arnold Kruckman's

Washington Letter

Washington is Drowning in VHP-No. 1

THE warm-air furnace manufacturers finally have been authorized to apply for CC ratings to obtain construction materials; supplies for maintenance, and repair and operation, and for capital equipment and production materials, but not for steel products and iron in the forms and shapes listed in Schedule 1, Order M-21, PR-28. This places warm air furnaces on the Critical Products List.

The meaning would seem to be that warm air furnaces now are considered to be urgently needed in the housing crisis. But when you analyze the thing, it does not work out that way. In the mind of this reporter it seems natural to assume that steel and iron are the very foundation of production of warm air furnaces. But apparently Capt. John D. Small, lately of Uncle Sam's Navy, a graduate from the Naval Academy at Annapolis, an intimate friend of Secretary of the Interior Julius Albert Krug, and admittedly short in industrial experience, sincerely cannot understand the need for steel or iron in making warm air furnaces. You can make no other deduction from the specific prohibition of CC ratings for strip, sheet, plate, and the rest of the metal products listed in Schedule 1.

The Captain, an engaging and pleasing person, seems to think that the warm air furnace manufacturers should be able to get along with the privilege of using the priority ratings in an effort to obtain fractional motors, blowers, filters, belts, and similar components. The rest of the ratings apply solely to the materials and equipment furnace manufacturers may need, and possibly may be able to obtain, for the better operation of their own plants, such as building materials, sand, brushes, tools, and the rest of the inventory every warm air furnace manufacturer may easily identify himself. Neither is material for ducts nor pipes covered by the CC ratings. To the outsider it is puzzling to try to make out just what Capt. Small has in mind. The confusion is increased by the other CPA Direction 9 to PR 33—which places warm air furnaces on the list of materials and equipment obtainable with the HH housing rating, and requires those who have the furnaces to set aside, after April 15, 70% of their inventory of furnaces to fill HH rated orders.

New Bureau Created

Morgan N. Johnston, Chief of the Heating Branch of the newly-formed Construction Bureau, which apparently takes the place of the former Construction Division of CPA, will administer both regulations. There is considerable sympathy for Mr. Johnston, here, because it is easily understood that the administration of these controls has the same element of uncertainty that is reflected in the creation of a new Bureau to do the work of the old Division. Incidentally, the old Construction Division, under C. P. Redick, continues in existence under the name of the Buildings Materials Division, "to stimulate," in the words of Capt. Small, "production of all building materials except lumber."

The new Construction Bureau, (a cut above a Division), is headed by Clarence A. Woodruff, assisted by Hugh Porter, who came to WPB in 1941, and has remained in the Government; and by Ivan A. Bickelhaupt, who represented the flat glass industry in the Capital before the war, and went into the Navy, with Pearl Harbor; he is one of the few Navy Reserve officers who achieved a Captain's rank. He met Small and Krug in the Navy. There is much of the old school tie business about the personnel which is seeping into Government. In some ways the effect is good, and in others it does not make the people in industry and business happy.

Bureau Personnel Deteriorating

Many business men who come to the Capital to talk business find that they do not speak the same language, industrially and commercially, as do those with whom they are now obliged to deal. They often learn that the Army and Navy idea about business, reflected by the former officers who have been placed in important positions in civil agencies, is largely ideological rather than practical. Men from industry and business also run into numerous persons who apparently are relics of the more academic and radical days in Government, and who often do not know what they are talking about, or who still are riding the dream horses of the peak of the New Deal. Under the urgent emergency conditions, when the New Deal came in, the people from industry and commerce were in the mood to try anything once. And during the war, they had the spur of the common objective of getting done with an unpleasant business. But in these days there is neither the spur of circumstances that surrounded the hectic opening phases of the New Deal, nor the driving need of the war; moreover, people who come here from

many industries and businesses usually have blood in their eyes. Most of them go away exasperated, irritated, and generally convinced that the people now doing business for the Government in the Capital don't know very much about the industries of the country, nor about Government. And generally visiting business people go home determined to forget regulations and orders.

The problems which confront Morgan Johnston, with the new warm air furnace regulation, give very much point to this discussion. There is the same lack of incisive and decisive leadership in the CPA that the people at large feel generally in the rest of the Government. Unquestionably, the only thing Johnston can do, to find out just what the regulation may mean, is to experiment. It has become a practice in CPA to develop the intent of an Order or a rule or a regulation by tests. In other words, no one is quite sure what Capt. Small or some other official has in mind, and usually they cannot find out; so the debatable point is put to a test.

Mr. Johnston does not know (so he can tell the industry), just how far a warm air furnace manufacturer may go in using the new CC rating to obtain a supply of fractional horsepower motors. One vigorous-habited producer told me he had posed the question, and that he thought Johnston would proceed to find out. It is certain Mr. Johnston will try to find out because he understands the industry problems, and he can foresee the volume of demands that are bound to swamp him when the housing program really gets under way.

Passing the Buck

It is difficult to say why CPA does business in this singular manner. Capt. Small is a profesional Navy man. The Navy is almost synonymous for red tape and "going through channels." This business of following the labyrinth of channels is also synonymous for ducking personal responsibility. If you can push the thing along to someone else, you can't be held responsible for the ultimate decision. It is tough on the business man, but it keeps the record of the Government official clear of potential black marks.

But that is by no means the only reason this CPA proceeding is so timid. Some of it goes back to an absence of leadership. In WPB they had men who were accustomed to responsibility, and who were willing to take a chance. They were of the right caliber, the status, the background, in business, commerce, industry and finance, and they brought this courage into Government. In these postwar agencies, however, usually you find those who seek leadership rather than supply it. Most of them have been trained to take orders rather than to give them. And many who have some administrative or executive skills, come from the schools, or from non-business activities, and therefore, are as comfortable with a business man of affairs as water is with oil; which explains some of the mutual distaste. Probably more than anything else that ails this earnest and perfectly sincere postwar Government personnel, here as well as in the regions and areas scattered around the country, are the pressures of politics.

Politics in Housing

It is nonsense to say that politics have nothing to do with housing, and the affairs that head up in the housing turmoil. Politics, like the Biblical poor, are always with us; the only difference is that during some periods we have more politics, and the politics are more obvious; at other times they are less perceptible. Unquestionably, if one had the facilities, and the hardihood, to dig up the politics, one could really understand the undertow that holds up progress in making orders, or regulations, or directives. For instance, over in OPA there has been under discussion for months an order raising the prices of warm air furnaces, particularly with the housing program in prospect. There have been the usual series of protracted conferences; and the usual formulation and re-formulation and re-re-formulation of the literary documents in the case. It is no longer a question of raising prices. It is fairly well known what prices the OPA people have in mind.

This reporter has heard figures, and undoubtedly you people out there all over the United States have heard some of the figures. Aside from the fact that the smaller furnaces to be used in the housing program will have the smallest increase, and that the larger furnaces will have the greatest increase, it would be useless to make a comment on prices. One figure seems reasonably certain: the 26-inch furnace apparently is linked with a 9% equation. The main point in this particular discussion is that if there had been no undertow these prices could have been set weeks ago. If the gumshoes fade out of the picture, it appears reasonable to assume the price-raise will be announced about the time this letter appears in print.

Steel Distribution

What politics there may be in the exemption of steel and iron from the CC ratings available to the warm air furnace industry, is a question you can answer as well as we can. Recently Capt. Small made a public statement in which he declared the "steel industry will continue its policy of cooperating fully with the CPA in the *voluntary* system of fair and equitable distribution of steel produced during this period of an acute shortage."

Not long ago Capt. Small told Senator Murray's Small Business Committee that an over-all tonnage between 60,000,000 and 65,000,000 tons steel would be produced this year. In the recent statement Capt. Small said that "every effort will be made by the industry (the steel industry) to wedge the minimum requirements of non-integrated mills, warehouses, small business and newcomers into steel mill schedules. The steel operating rate is currently 88% of capacity, up 8 points since the end of the steel strike, and is expected to go above 90% of capacity and will produce 56,000,000 tons annually, 25% higher than any previous peacetime production."

Capt. Small took occasion to praise the steel industry for "its splendid performance in distributing steel between V-J Day and the start of the steel strike. The record the industry achieved in that period was outstanding." In closing his statement Capt. Small put his finger on one reason for present difficulties: "During the war, measuring rods were much simpler than they are today. Today everyone in peacetime business is virtually on an even footing and there is no yardstick such as 'Does this help win the war'."

When he made his statement to Senator Murray's Committee Capt. Small said: "On galvanized sheets, which is the tight one, the great bulk goes into farm implements; and part of it goes into the farms for roofing and siding, and part of it goes into other things that are desperately short, like warm-air heaters for housing, where we are very short. There is a

(*Continued on page* 83)

Veteran Housing Program Order No. 1

(The Order Causing So Much Discussion)

THE Civilian Production Administration issued Veterans' Housing Program Order 1 on March 26, 1946. Restrictions on new construction and repairs to existing structures are imposed. However, the order does not forbid or require authorization for the continuance of construction work already begun if any of the materials that are to be an integral part of the structure have been incorporated in it on the site before March 26, the date of the order, and if the work is being carried on at that date. Construction jobs for which preference ratings have been issued under Priorities Regulation 33 of the Veterans' Emergency Housing Program require no additional authorization.

The Civilian Production Administration is setting up in each of the Federal Housing Administration cities a CPA Construction Office. Associated with each of these CPA offices will be an advisory committee of outstanding citizens of the community. This committee will determine whether a construction job is essential under existing conditions.

The Veterans' Emergency Housing Program, set forth February 7, 1946, by the Housing Expediter in his report to the President, calls for the construction of an unprecedented number of moderate and low-cost housing accommodations to meet the needs of returning veterans. The fulfillment of requirements for the defense of the United States has created a shortage in the supply of materials and facilities required for construction, for defense, for private account and for export. It will be impossible to carry out the Veterans' Emergency Housing Program without diverting critical materials from deferrable or less essential construction. The following order is deemed necessary and appropriate in the public interest and to promote the national defense.

Section 4700.1—Veterans' Housing Program Order 1. (a) What this order does. In order to carry out the Veterans' Emergency Housing Program, this order forbids the beginning of construction and repair work on buildings and certain other structures without specific authorization under paragraph (h) of the order, with the exception of certain small jobs and other work covered by paragraphs (d), (e) and (f). The restrictions of the order apply whether or not the materials needed are on hand or are available without priorities assistance. (See Comment No. 1.)

(b) **Structures and work covered by this order. (1) Kinds of structures.** The restrictions of this order apply to certain kinds of work on structures. (See Comment No. 11.) As used in the order, "structure" means any building, arena, stadium, grandstand, pier, moving picture set or billboard, whether of a permanent or temporary nature (however, the erection of stands or other structures which have been used before and are being erected only for a temporary purpose and are to be taken down after the temporary purpose is served is not covered by the order). The term "structure" does not include roads, streets, sidewalks, railroad or street or interurban or plant railway tracks or operating facilities (other than buildings), fences, silos, trailers (except when demounted and installed on a foundation), bridges, tunnels, subways, pipe lines, utility facilities (except buildings) providing for electric, gas, sewerage, water, central steam heating or telephone or telegraph communication services including power or utility lines and sewers, surface or underground mines, wells, dams, canals or drainage or irrigation ditches. The term "structure" also does not include anything that is not attached to the land or to a structure as defined above, or any kind of equipment installed outside of and not attached to a building or other structure.

Comment No. 1

VHP-1 says "this order forbids the beginning of construction and repair work on buildings, . . . does not restrict a construction, repair, alteration or installation, the cost of which does not exceed $400 for a house." The rumor was—this stops most residential work because we cannot replace a furnace for $400. Not that $400 won't cover the cost of replacing the furnace, but most replacements require replacement of some or all piping, new cold airs, etc.

Contractors will be interested in knowing, then, that the Chicago FHA office has told several contractors "it is very simple to get permission to do *necessary* repair and replacement work—all that is necessary is for the contractor to get a letter signed by the *owner*, in duplicate, that the work is necessary; FHA will return one copy, usually the next day, authorizing such *necessary* work to go ahead with approval." FHA has also told contractors that only where equipment or materials are on the PR-33 critical list can there be any difficulty. (Furnaces are now in Schedule A of PR-33 and therefore critical.)

If this is to be the attitude of FHA offices, contractors can, with reasonable hope, proceed with usual replacement work and there should be a minimum of red tape. Try your FHA offices before you cancel any job.

Comment No. 11

What kind of housing is being approved?

Through March 29, the 71 FHA field offices, acting for the Civilian Production Administration, had approved 78,763 applications for construction of 220,712 new dwelling units and 16,793 applications for conversion of existing structures to provide 24,229 additional dwelling units.

All of these new dwelling units are to be built for sale at $10,000 or less or for rent at $80 or less a month, with 55 per cent of the total approvals being for units to sell below $7,500 or rent at less than $60 a month. More than 28 per cent of the total approval are for units to sell below $5,500 or rent for less than

$50 a month while about 17 per cent of the total approvals are for units selling below $4,500 or renting for less than $40 a month.

Comment No. 16

Repair work. Most of the law relates to *new construction.* As explained in Comments No. 1, 5, 8, 11 essential repair work is expected to go ahead. CPA stated on April 11 that any home owner may make repairs or alterations which are necessary or will provide additional living space—*but priority aid will not be given.* This might be interpreted—if you can scrape up the materials, go ahead.

Comment No. 15

This rating cannot be used by the manufacturer. We don't know how a manufacturer is expected to get materials for furnaces unless a system of directives or directions is installed which the furnace manufacturer places with the steel mill.

But we would like to point out that any directive—any rating—is useless if the mill does not have materials to fill the order. There is no law in the land which can compel a mill to ship galvanized iron *which they do not have.*

There is no galvanized iron—legitimate galvanized iron. Steel mills say they will produce in 1946 some 65 per cent of the total production of all kinds of steel produced in 1941. But the mills also say they will produce in 1946 *only 25 per cent of the galvanized iron* they produced in 1941. If true, this means there just won't be enough galvanized iron. Something similar (but we haven't heard the figures) applies also to light gauge black sheet.

So we ask—"what use is all this rig-a-marole if it won't get materials?" And remember—what good is a furnace if there is no pipe and registers to go with it? (See Comment No. 5).

How many houses really are needed? We don't believe anybody knows. We've never been told how CPA arrived at 2,700,000 homes. We do know that one survey showed 596 communities reported the housing situation acute; 401 reported housing serious but not acute; 75 said they had no housing problem at all. The total of this survey—*projected for the entire country*—shows 800,000 to 1,000,000 as the real need. That's a long ways from 2,700,000.

Comment No. 6

VHP-1 does not forbid or require authorization for the continuance of construction work already begun, if any of the materials which are to be an integral part of the structure have been incorporated in or were at the site on March 26 and if the work was being carried out on March 26.

It is interpreted that this means—for a house—that if the foundation was in and work was going on March 26 all subcontractors (such as the heating contractor) are permitted to complete their work on *that particular house.*

(2) Kinds of work. The restrictions of this order apply to constructing, repairing, making additions or alterations (including alterations incidental to installing any kind of equipment), improving or converting structures, or installing or relocating fixtures or mechanical equipment in structures. (See Comment No. 16.) These terms include any kind of work on a structure which involves the putting up or putting together of processed materials, products, fixtures or mechanical equipment, if the processed materials, products, fixtures or mechanical equipment are attached to the land, or are attached to a structure and used as a functional part of the structure, or are attached so firmly to the land or structure that removal would injure the material, product, fixture or mechanical equipment or the structure. The laying of asphalt or other tile or linoleum cemented or otherwise attached to the structure is covered by the order. However, repainting, repapering, and sanding floors, and greasing, overhauling, repairing or installing repair or replacement parts in existing mechanical equipment in all types of structures, where no change in the structure is made, are not covered by the order.

(3) Fixtures and mechanical equipment. The term "fixture" means any article attached to a building or structure and used as a part of the building or structure. The term "mechanical equipment" means any equipment which is used to operate a building or other structure. The following items are included within the phrase "fixtures and mechanical equipment" if they are attached to the building or structure in any of the ways indicated later in this paragraph: plumbing, heating, ventilating and lighting equipment, panelling, bookcases, bars, soda fountains, show cases, booths, wood or metal partitions, counters, and the like. These articles are considered to be attached to a building or structure if they are attached by nails or screws to the building, if they are connected to the plumbing or other piping system of the building, if they are connected to the lighting system of the building (except by connection to an existing outlet), or if a base or foundation is built for the item, or if the item is cemented to the building or structure. The phrase "fixtures and mechanical equipment" does not include the following: machine tools, blast furnaces, conveyors, elevators, process piping, control or testing equipment used for industrial or utility purposes or in a laboratory, power generating or transmitting equipment, such as boilers, generators, transformers, and the like (however, where the purpose of boilers, transformers and similar equipment is primarily to provide electricity or steam for lighting or heating the building in which they are installed, they would be mechanical equipment), medical equipment in a hospital, washing machines, or dryers in a commercial laundry, compressors or cooling equipment in a cold storage warehouse or frozen food locker plant, gasoline pumps and hydraulic lifts in a garage or service station, and stoves, refrigerators (other than refrigerators constructed as an integral part of a building), food-warming equipment and dish-washing equipment in a restaurant.

(c) Prohibited construction. (1) No person shall begin to construct, to repair, to make additions or alterations to, to improve, to convert from one purpose to another, or to install or to relocate fixtures or mechanical equipment in, any structure, public or private, in the forty-eight states and District of Columbia, Puerto Rico or the Virgin Islands, except to the extent permitted under paragraphs (d), (e) and (f), or when and to the extent specifically authorized under paragraph (h). (See Comment No. 15.) No person shall carry on or participate in any construction, repair work, additions, improvement, conversion, alteration, installation or relocation of fixtures or mechanical equipment prohibited by this order. (See Comment No. 6.) The prohibitions of this paragraph apply to a person who does his own construction work, to a person who gets a contractor to do the work, to contractors, subcontractors, architects and engineers working on a job which is being carried on in violation of this order or getting others to work on it or to supply materials for

it. (See Comment No. 3 and No. 4.)

(2) This order forbids the beginning of certain kinds of work. (See Comment No. 8.) To "begin" work on a structure means to incorporate into a structure on the site materials which are to be an integral part of the structure in question. Demolition, excavation and similar site preparation do not constitute beginning construction. The order does not apply to work which was begun before March 26, 1946, and which was being carried on at that date and which is carried on normally after that date. However, this rule only applies to the particular building or other structure begun before March 26, 1946. It does not apply to any other building or structure which had not itself been begun by that date even though the two are closely related.

(d) **Exemption for small jobs.** (1) This order does not restrict a construction, repair, alteration or installation job, the cost of which does not exceed the allowance given below for the particular kind of structure involved.

(i) $400 for a house or other structure (such as a garage) on residential property designed for occupancy by five families or less. This allowance also applies to farmhouses and other housing accommodations on farms, except bunkhouses and other accommodations for transitory farm laborers. (See Comment No. 1 and No. 5.)

(ii) $1,000 for a hotel, resort, apartment house, or other residential building designed for occupancy by more than five families. (See Comment No. 2 and No. 10.)

(iii) $1,000 for a building used primarily for one or more commercial or service establishments such as offices, banks, stores, laundries, garages, restaurants, night clubs, theaters, repair shops, warehouses, frozen food locker plants and radio stations. (See Comment No. 9.)

(iv) $1,000 for a farm, excluding farm houses which are covered by paragraph (d)(1)(i) above. A farm means a place used primarily for raising crops, livestock, dairy products or poultry for the market.

(v) $1,000 for a church, hospital, school, college or a publicly owned building used for public purposes, or for an orphanage or other building used exclusively for charitable purposes.

(vi) $15,000 for a factory, plant or other industrial structure which is used for the manufacturing, processing, or assembling of any goods or materials, (See Comment No. 12) for a logging and lumber camp, for a pier (other than a pier designed for amusement, entertainment or other commercial purposes), for a structure used for or in connection with a railroad or street railway or a commercial airport, for a bus terminal, for a truck terminal operated by a common or contract carrier by truck, or for a research laboratory or pilot plant or for a motion picture set. This allowance is applicable to structures used for oil, gas or petroleum producing, refining, or distributing (except service stations and garages which are covered by paragraphs (d)(1)(iii) above). It is also applicable to utility structures (public or private) providing for electric, gas, sewerage, water, central steam heating, or telephone or telegraph communication services.

(vii) $200 for a structure covered by this order which does not fall within one of the classes listed above.

(2) For the purpose of determining whether a particular job is exempted from this order by paragraph (d), the "cost" of a job means the cost of the entire construction job as estimated at the time of beginning construction. This includes cost of paid labor engaged in the construction work, regardless of who pays for it, the cost or value of new fixtures, mechanical equipment and materials incorporated in the structure, whether or not obtained without paying for them, and the amount paid for contractors' fees. It does not include the cost or value of previously used fixtures, mechanical equipment and materials, the value of unpaid labor, or the cost or value of machinery and equipment (other than mechanical equipment) or the cost of labor engaged in assembling and installing the machinery and equipment.

Comment No. 3

The U. S. Department of Commerce reports: "A rough forecast of the impact of the Wyatt housing program on construction volume in 1946 indicates that if 1,200,000 units are started, the dollar volume of residential construction will reach 3.9 billion dollars."

Comment No. 4

Construction Division of U. S. Department of Commerce says: "The non-residential total dollar volume that is likely to be achieved under the Wyatt program is expected to amount to about 3.3 billion dollars of privately financed construction and about 1.7 billion dollars of publicly financed construction."

Comment No. 8

What is meant by "beginning construction?" (See Comment No. 6.)

Comment No. 5

It has been estimated by Civilian Production Administration that the following furnaces will be needed for the first phase of the housing program for 1946:

565,000 furnaces for veterans' housing
35,000 non-rated furnaces for other homes
300,000 furnaces for replacements

Manufacturers of furnaces reported to CPA that they are operating no greater than 50 per cent of possible volume and that the above needs can be met only if furnaces are declared "critical."

Accordingly, on April 10, furnaces were placed on the "critical list" (Schedule A of PR-33 and Schedule 1 of PR-28). This means that manufacturers of furnaces may get necessary materials to produce the above number of furnaces.

Note 300,000 furnaces for replacement is more than the number of replacement furnaces contractors probably received during WPB days.

Unfortunately, pipe, fittings, duct work, registers and grilles *were not placed on the critical list.* This is a serious oversight and contractors realize that furnaces without piping are useless. National Warm Air Heating & Air Conditioning Ass'n is urging every manufacturer of pipe and fittings, registers and grilles, duct work, blowers to write to Morgan Johnston, Civilian Production Administration, Social Security Building, Washington, D. C., asking that these accessories be declared critical. Also all jobbers and dealers write Mr. Johnston. If the need is plain enough, consideration is likely.

Comment No. 2

The $1,000 limit permitted for apartments, or buildings used by more than five families, has created great concern. The attitude of Housing Expediter Wyatt is expressed in a telegram sent by him to F. W. Dodge Corp. on March 28. The telegram says in part: "One of the vital requirements of the housing program is housing for rent because countless veterans will not want to buy or be in a position to do so. Therefore, we hope the construction industry will do its utmost to produce them. I want to assure you that priorities are issued to produce homes for veterans and that multiple dwellings have a highly important part in the program."

Comment No. 10

Expediter Wyatt has stated: "We intend to give all possible encouragement to construction of apartment buildings. Such large jobs give work to mechanics not usually employed on single family houses. Many veterans cannot buy or do not want to buy a house—for these, multi-family structures are a "must."

Comment No. 9

At a meeting in Chicago, Fred Stevens, Chicago Regional CPA Director, who will administer VHP-1 in the Chicago area, said:

(1) The order will be administered to the letter. Relaxations will come as the situation develops.

(2) Consideration of applications for work requiring approval will be reasonable and liberal in many respects.

(3) Essentiality will not be restricted to housing directly. Other construction will be approved if materials are available and if it seems the project is desirable. For instance, a manufacturing plant will be approved if the plant insures employment which will be stopped if the plant is not built.

(4) Apartment buildings and other multi-family dwellings will certainly be approved.

(5) It is expected contractors will make mistakes. So long as such mistakes are honest, violators will be dealt with leniently. "Chiselers" will be severely dealt with.

Comment No. 12

Housing Expediter Wyatt and CPA Administrator Small have stated several times that while the rules look stiff, it is intended to relax them where non-housing materials can be used to build plants, factories, warehouses, etc. If materials cannot be used for housing, or in communities where housing is secondary in need to other structures—other construction will be approved. Wyatt and Small have said they anticipate some 22 billion dollars in non-housing construction in the period 1946-1848.

Comment No. 17

What constitutes a "single job?" Considerable clarification must come on this, but for the moment you cannot install a furnace on April 15; then go back on April 20 and get another order for pipe and fittings; then return April 30 and get an order for automatic controls. All these are a "single job" as interpreted now.

Comment No. 18

So far as we know now (April), repair and maintenance can go on in houses (d) (1) and structures (d) (6) and it is likely this means replacement *in kind*. In other words, replace a worn out gravity furnace with another gravity furnace—same fuel. What happens when the old pipes fall down when the furnace is "pulled" is not known, but for the moment we believe that Comment No. 1 applies and a complete replacement will be approved.

(3) For the purpose of this exemption, a related series of operations which are performed at or about the same time or as part of a single plan or program constitute a single job. (See Comment No. 17.) No job which would ordinarily be done as a single piece of work may be subdivided for the purpose of coming within this exemption. When a building or part of a building is converted from one purpose to another, all work incidental to and done in connection with the conversion must be counted as one job. So also if a building is being renovated, improved or modernized over an extended period, all work done in connection with the modernization (other than work done before March 26, 1946) must be considered as part of one job, even though separate contracts are let for the different parts of the work. The definition of a job given in this paragraph may not be used in determining whether construction has started prior to the issuance of the order under paragraph (c) (2).

(4) If a structure is used for more than one purpose and might therefore fall within more than one of the classes indicated, the use to which the greatest part of the structure will be put (computed on the basis of the floor area where applicable) determines the allowance. If a structure is being converted from one purpose to another, the allowance applicable to the structure after the conversion is the maximum allowance for the conversion. The allowances given for jobs on a structure apply to all subordinate or related structures situated near and used in connection with the structure.

(e) **Exemption for repair and maintenance work in industrial utility and transportation buildings and structures.** The prohibitions of this order do not apply to maintenance and repair work in structures covered by paragraph (d)(1)(vi) of this order. For the purpose of the exemption given by this paragraph, "maintenance" means the minimum upkeep necessary to keep a structure in sound working condition and "repair" means the restoration of a structure to sound working condition when the structure has been rendered unsafe or unfit for service by wear and tear, damage, failure of parts, or the like. (See Comment No. 18.) However, neither maintenance nor repair includes the improvement of any structure by replacing material which is still usable with material of a better kind, quality or design. No maintenance or repair work which is capitalized by the person doing the maintenance or repair work may be performed under this exemption. Alterations to a building or other structure covered by paragraph (d)(1)(vi), including alterations incidental to installation of equipment, are not exempted by this paragraph, even though they are not capitalized, and may only be done when and to the extent permitted under paragraph (d) or when specifically authorized.

(f) **Other exemptions.** (1) **Disasters.** (i) The prohibitions of this order do not apply to the minimum work necessary to prevent more damage to a building or structure (or its contents) which has been damaged by flood, fire, tornado, or similar disaster. This does not include the restoration of the structure to its former condition.

(ii) The prohibitions of this order do not apply to the repair, rebuilding or reconstruction of any house (including a farmhouse) or any farm building which was destroyed or damaged by fire, flood, tornado or similar disaster, if the total cost of the repairs, rebuilding or reconstruction does not exceed $6,000 and if the reconstruction is started within sixty days of the occurrence of the disaster.

(2) **Military construction.** The prohibitions of this order do not apply to work by or for the account of the U. S. Army or Navy.

(3) **Veterans' Administration.** The prohibitions of this order do not apply to work on construction projects of the Veterans' Administration, including projects being built by the Corps of Engineers for the Veterans' Administration, or to the remodelling of a building or any part of a building which has been leased to the Veterans' Administration or to Public Buildings Administration for occupancy or use by the Veterans' Administration.

(g) **Prohibited deliveries.** No person shall accept an

order for, sell, deliver or cause to be delivered materials which he knows or has reason to believe will be used in work prohibited by this order.

(h) **Authorizations.** Persons who wish to begin work which is prohibited by this order may apply for authorization. (See Comment No. 7.) If the application covers housing accommodations under Priorities Regulation 33 (including farm dwellings), it should be made on Form CPA 4386. Applications for non-farm housing accommodations should be filed with the local office of the Federal Housing Administration. Applications covering housing accommodations on a farm should be filed with the appropriate County Agricultural Conservation Committee. The assignment of ratings for or approval of housing accommodations under Priorities Regulation 33, whether before or after the issuance of this order, constitutes an authorization under this order to do the work for which priority assistance or approval was given under that regulation. (See Comment No. 14.) If the application covers work on a farm (other than farm dwellings), the application should be made on Form CPA 4423 and should be filed with the appropriate County Agricultural Conservation Committee. If work on any other kind of structure is involved, the application should be filed on Form CPA 4423 with the appropriate Construction Field Office of the Civilian Production Administration. Applications will be reviewed to see whether and how much the proposed construction would interfere with the Veterans' Emergency Housing Program. In addition, the essentiality of the proposed work in relation to the Veterans' Emergency Housing Program, to the elimination of a bottleneck to the reconversion of the national economy from a wartime to a peacetime basis, to the public health and safety of the community, or to eliminate an unusual and extreme hardship will be taken into consideration in determining whether the application should be approved. In case of emergency, a request for authorization may be made by telegram to the appropriate Civilian Production Administration Construction Field Office. The telegram should state the nature of the emergency (fire, flood, etc.), the use to which the building will be put, the type of construction, the estimated cost of construction and the reasons why immediate reconstruction is necessary.

(i) **Construction under authorization.** When a person is specifically authorized, either by approval of Form CPA 4423 or Form CPA 4386 or otherwise, to do work restricted by this order, he must observe the restrictions imposed on him by the authorization, and in doing the authorized work, he must not do any work of the kinds covered by the order unless it is specifically covered by the authorization. (See Comment No. 13.) He may not, in connection with a job which has been specifically authorized, do additional work under the exemption given by paragraph (d). When an application on Form CPA 4423 has been approved a placard will be sent to the applicant stating that the construction has been approved under this order. The applicant must place in the placard the project serial number and must set up the placard in front of the project site in a conspicuous location within five days after construction has been started and he must keep the placard there until completion of the work.

(j) **Violations.** Any person who wilfully violates any provision of this order or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using material under priorities control, and may be deprived of priorities assistance.

(k) **Communications.** All communications concerning this order should be addressed to the Civilian Production Administration, Washington 25, D. C., Ref.: VHP-1.

(l) **Reports.** All persons affected by this regulation shall file such reports as may be requested by the CPA, subject to the approval of the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Comment No. 7

"Who will give approval?" CPA is setting up in each FHA office a CPA staff. Associated with each such CPA-FHA office will be an "advisory committee" of citizens—one appointed by the mayor or governor, one from general business, a representative of the builders, of building materials, the press and the Director of the FHA office.

This committee will first determine the needs of the community. This committee will approve or disapprove each project. If the project is not essential, it will be rejected. If essential, it will be approved.

This judgment applies primarily to *new* housing construction.

It is indicated that the committee will not be asked to pass on the thousands of applications for repair, replacement, maintenance work—such approval probably will be passed upon by FHA-CPA.

Comment No. 14

How to get a rating?

A person who wishes to build, complete or convert moderate cost urban housing should make application to the appropriate state or district FHA office on Form CPA-4386. The applicant must be able to start work within 60 days. If the application satisfies requirements, the FHA will authorize the use of the HH rating. The builder extends this HH rating to the sub contractor who, in turn extends the rating to his supplier or manufacturer by placing on his regular order this certification:

Reconversion Housing Program
Project Serial No.....
Rating: HH

I certify to the CPA that the materials covered by this order will be used only in a housing project being build under the Reconversion Housing Program at ..... (give location or project) and that I will comply with the limitations on sales prices and rents and preferences to veterans provided for in Prorities Regulation 33 and my approved application.

.....Builder.....

This preference rating may be used *only* to get items on Schedule A of PR-33 (furnaces).

This procedure probably will not be used for furnace replacements, repair and maintenance work costing over $400. Instead, as explained in Comment No. 1, probably a letter from the home owner certifying that certain work is necessary will be used. We may be wrong in this—clarification must come later.

Comment No. 13

To complete the housing program, National Housing Agency foresees the employment need for more than 2 million on-site, off-site, skilled, semi-skilled and unskilled workers. This is nearly three times the presently estimated total of 700,000 workers employed at housing sites or producing residential building materials.

A Suggested "In-Shop" Training Program for G.I.'s

UNDER the Veterans Administration operation of the GI apprenticeship training program, it is specified that a shop desiring to employ a GI apprentice must provide "in-shop" training for the GI and that this instruction must be approved by the designated agency of the state—usually the state Board of Education.

The problem is solved in areas where a joint labor-management committee is operating. Under such a committee it is recommended that the GI be indentured *to the committee* and the committee sets up the course of instruction to be given by the shops working in the committee's area.

But there are areas where there is no local labor-management committee. The problem then is—what must the shop agree to teach the veteran in order to obtain approval by the state Board of Education?

In an effort to answer this, the Fox Valley Furnace and Sheet Metal Association (Illinois) appointed a committee to study all the instruction programs used by members and which had been approved by the Illinois Board of Education. The committee has prepared the following three veteran's training programs. Any member of the association who seeks approval for his shop as a training school will submit this program and will follow it through 48 months of instruction.

The Fox Valley association offers these programs to the industry as a guide for those who wish to train a GI, but do not know how to prepare a program or are in doubt as to the makeup of a program which will be approved.

Program No. 1
SHEET METAL SHOP ONLY

(A) Pattern Drafting ..... 12 Months
(B) Shop Practice ..... 12 Months
1. Shop assembly
2. Use of tools
(C) Erection and Assembly on Job .... 6 Months
(D) Soldering ..... 2 Months
1. Copper
2. Galvanized sheets
3. Stainless steel
4. Black iron
(E) Gutter Work ..... 6 Months
1. Flashings
2. Skylights
3. Metal decks
(F) Industrial Sheet Metal ..... 4 Months
The Fabrication and Erection of
1. Ventilation
2. Fume removal
3. Tanks and vats
4. Blow pipe work
5. Breechings
6. Dust collecting
(G) Welding ..... 2 Months
(H) Roofing ..... 4 Months

Program No. 2
HEATING and AIR CONDITIONING SHOP

(A) Pattern Drafting ..... 12 Months
(B) Shop Practice ..... 12 Months
1. Shop assembly
2. Use of tools
3. Care of tools
(C) Erection and Assembly on Job ..... 6 Months
(D) Soldering ..... 2 Months
1. Copper
2. Galvanized sheets
3. Stainless steel
4. Black iron
(E) Gravity Warm Air Heating ..... 4 Months
(F) Forced Air Heating ..... 4 Months
(G) Stoker Installation and Service .... 2 Months
(H) Oil Burner Installation and Service. 2 Months
(I) Gas Heating Installation and Service 2 Months
(J) Controls ..... 2 Months

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Program No. 3
GENERAL SHEET METAL SHOP
Including HEATING and AIR CONDITIONING

(A) Pattern Drafting ..... 12 Months
(B) Shop Practice ..... 12 Months
1. Shop assembly
2. Use of tools
3. Care of tools
(C) Erection and Assembly on Job .... 6 Months
(D) Soldering ..... 2 Months
1. Copper
2. Galvanized steel
3. Stainless steel
4. Black iron
(E) Gutter Work ..... 6 Months
1. Flashings
2. Skylights
3. Metal decks
(F) Industrial Sheet Metal ..... 4 Months
The Fabrication and Erection of
1. Ventilation systems
2. Fan removal
3. Tanks and vats
4. Blow pipe work
5. Breechings
6. Dust collecting
(G) Heating (Gravity and Forced Air). Including Installation and Service of ..... 3 Months
1. Oil burners
2. Gas-fired equipment
3. Stokers
4. Controls
(H) Welding ..... 1 Month
(I) Roofing ..... 2 Months

Veterans Administration Explains How Non-Union Employer Trains GI

From: March 9, 1946
American Artisan
To:
General Omar N. Bradley, Administrator,
Veterans Administration,
Washington 25, D. C.

Dear Sir:

The readers of AMERICAN ARTISAN are generally classed as sheet metal contractors and fabricators. Our employers use "sheet metal mechanics" as designated by War Manpower Commission and Department of Labor.

Joint Labor-Management Apprenticeship Committees are now in operation in a large number of communities where there is a local employees' union and employers of union labor. We believe that the matter of obtaining GI apprentices is pretty well taken care of and pretty well understood by employers in these areas.

But there is another type of area which seems to be having difficulty in setting up GI Apprenticeship training. So, the purpose of this letter is to obtain from Veterans Administration some recommendations on just what employers in such areas may do, as follows:

1. How can the owner of a shop employing non-union labor in an area which has no or little union labor obtain approval as an approved training shop and how can the veteran so employed obtain the vocational schooling which is supposed to accompany the shop instruction?

Answer:

(1) The owner of a shop employing non-union labor may obtain approval as an approved shop in the same manner as all other business firms and industrial establishments. Under the Servicemen's Readjustment Act of 1944, as amended, business firms or industrial establishments are approved, as being qualified and equipped to provide training to veterans, by an Agency designated by the Governor of the State. Business firms or industrial establishments may be considered qualified and equipped to warrant approval when their equipment and trained personnel provides such experience that the trainee working under direction and supervision, is able to qualify for the position for which he is being trained at the expiration of the training period. Application for approval should be made directly to the State approving agency, which in most States is the Department of Education.

If vocational schooling is provided for in the training program, the veteran may take supplemental, correspondence, or part-time schooling while taking on-the-job training, with the cost thereof to be paid by the Veterans Administration. As conditions will vary in each locality, this additional schooling should be discussed with the Training Officer of the Veterans Administration having supervision over the trainee.

2. How can a group of employers of non-union labor obtain vocational instruction for their GI apprentices where there is no co-operating union labor and no union local and no management-labor committee?

Answer:

If by vocational instruction you mean shop instruction, then training is provided in the shop through experience, working under the direction and supervision of journeyman craftsmen. If you are referring to supplemental or related schooling, the question is answered in second paragraph of (1) above.

3. Can employers of non-union labor, in non-union labor areas form management-labor apprenticeship training committees and if so, who must approve such committees and does such a committee enjoy all the benefits of a union labor-management apprenticeship committee?

Answer:

(3) This is a matter that does not come under the jurisdiction of the Veterans Administration.

4. School boards in some areas have told our employers that they can not conduct vocational classes unless there are at least eight GI apprentices enrolled for sheet metal training. Is there any way under which such employers in such areas can obtain vocational instruction and how can the employer in a small town where there may be only one or two shops obtain instruction for his GI apprentices?

Answer:

(4) It would appear that this is a local problem that must be dealt with in the light of existing local conditions. If there are no local schools for veterans available, and the training program requires supplemental schooling to qualify for the position, and the veteran desires to do so, he may apply for a correspondence course to be taken at the same time he is undergoing on-the-job or apprenticeship training. It is also possible for the employer to employ instructional personnel.

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Veterans Administration Is Going To Check Your GI

Also of interest should be the following letters from Veterans Administration:

DEPARTMENT OF LABOR

An Instruction has been issued by General Bradley to all field offices of the Veterans Administration authorizing them to accept the enrollment of eligible veterans with joint apprenticeship committees *which have been approved by the appropriate state agency.* This decision by the Veterans Administration is extremely important to the entire construction industry apprenticeship program. The following statement was approved on February 5 by the General Committee on Apprenticeship for the Construction Industry.

"In view of the importance of construction apprenticeship, the committee recommended that local joint committees contact immediately the proper state cer-

tifying agency and gain approval as a training institution. Further, that where no joint committees exist, prompt action be taken to establish such committees and secure approval from the state agency.

"Wherever a joint apprenticeship committee exists, the committee should be advised, when making application to the state agency for recognition, that recognition be requested for the full territory as covered by the joint committee; that no one can become an apprentice in that industry in that territory unless he goes through the joint committee and standards are adhered to.

"As a further safeguard to the veteran, the committee urges that all apprentices indentured in the building trades be indentured to the joint committee. Local groups should be impressed with the fact that now that the Veterans Administration has given them full recognition, they should step in and do the job or someone else will do it, and not to their liking."

VETERANS ADMINISTRATION

Mr. Marion H. Hedges,
Director of Research,
International Brotherhood of Electrical Workers,
1200 15th Street, N. W.,
Washington, D. C.
My dear Mr. Hedges:

The proposal of the General Committee on Apprenticeship for the Construction Industry which you recently submitted has been examined and consideration has been given to your recommendations which are given on Page 18 of the material which you furnished. You have recommended that joint labor-management committees be recognized as training institutions qualified and equipped to provide training for veterans under the terms of either Public 16 or Public 346, 78th Congress, and that the plan proposed for the State of Oklahoma be approved as a pattern for all states of the Union.

It is understood that joint labor-management committees have been set up in some crafts and localities and have been charged with the responsibility for controlling the training of persons in standard apprenticeship courses. This assigned responsibility includes the acceptance of an applicant for apprenticeship training, the determination of the establishment or establishments in which the training is to be provided, the arranging for the placement of the applicant in the chosen establishment, the determination that the establishment provides the prescribed course in accordance with the accepted standards and that the applicant continues to diligently apply himself to the course and to efficiently accomplish its purposes. It is further understood that when such an arrangement exists, it is with the full agreement of management and labor.

Admittedly, such joint committees are not actually giving education in the strict sense of the term since the education is being provided by business establishments. However, it may be presumed for the time being that the appropriate agencies of the respective states will have determined in advance that each joint committee which it approves is actually performing the functions for which it was established in an efficient manner and is arranging for training in establishments which are adequately equipped and staffed to provide a complete and well-rounded course of instruction. On this assumption, I have determined that joint apprenticeship committees may be recognized as qualified and equipped to provide suitable training to veterans under Public 346, 78th Congress, in those states in which such recognition has been granted. Consequently, an instruction will be issued to all field offices of the Veterans Administration which will authorize them to accept the enrollment of eligible veterans with joint apprenticeship committees which have been approved by the appropriate state agency. This will amount to a full acceptance of your recommendation No. 1 which appears on Page 18 of the material which you submitted under the title, "Proposal of the General Committee on Apprenticeship for the Construction Industry."

Your second recommendation was that "the so-called Oklahoma plan be approved as a pattern for all states of the union." This plan is described on Page 14 of the material submitted. It is stated in part:

> "Individual establishments participating in the area-wide program become approved training establishments under Public 346 by merely subscribing to the area-wide apprenticeship standards. They have no dealing with the Veterans Administration whatsoever."

The last sentence of the quoted statement will need to be modified to the extent that it will permit the Veterans Administration to supervise the individual veteran and obtain from the establishment current information concerning the veteran's conduct and progress. The Veterans Administration is charged by law with the responsibility for determining that the veteran's conduct and progress while in training remain satisfactory, in accordance with the standards and practices of the institution, and the individual veteran's right to continue to receive the benefits of Public 346 is dependent upon his conduct and progress continuing to be satisfactory. *It will therefore be necessary for representatives of the Veterans Administration to contact enrolled veterans at their places of training in order to determine that they are actually receiving a course of training rather than being subsidized in employment and that they are conducting themselves and progressing in a manner which will permit them to continue to receive the subsistence allowance provided by the law.* Furthermore, there will need to be contact with the training establishment, either directly or indirectly, so that the Veterans Administration may be accurately informed as to the amount of compensation for productive labor which the veteran has received each month from his employer-trainer. This is necessary because the law provides that adjustments shall be made in the amount of subsistence allowance as the Administrator may determine when he finds that an enrollee is receiving compensation for productive labor performed as a part of his apprenticeship or other training-on-the-job. Inasmuch as the enrollee will receive such compensation for productive labor from the training establishment rather than from the joint apprenticeship committee, it follows that authentic reports as to the amount paid must come from the training establishment. It will thus be seen that the Veterans Administration must have certain dealings with the training institution. However, there will be no objection to permitting training establishments to forward their reports through the authorized joint committee if that procedure appears to be most satisfactory in a given situation.

OMAR N. BRADLEY,
General, U. S. Army,
Administrator.

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION Says

Dealer Training Schools Have Started

THE National Warm Air Heating and Air Conditioning Association announces the beginning of its dealer training program covering design, installation and operation of warm air gravity and warm air-winter air conditioning systems. Based on present estimates, thirty (two-day) "Application Engineering Conferences" will be held this year with an expected estimated average attendance at each conference of 75 warm air dealers and their employees, or a grand total for 1946 of 2,250 students. For 1947 it is estimated 70 conferences will yield a total attendance of 5,250, making a combined attendance for 1946 and 1947 of 7,500 students. The hope is this large training program will have the end result of greatly improved warm air installations and operation, resulting in a high degree of user satisfaction with the ultimate in "Indoor Comfort."

Dealer training through Application Engineering Conferences takes its place in the work of the Association as a permanent activity of this thirty-year old organization, alongside of the research program which for twenty-eight years has been sponsored by the Association in cooperation with the University of Illinois.

According to present plans, Application Engineering Conferences will be held in the following cities beginning the week of May 13 to about June 15: Indianapolis, Indiana; St. Louis, Missouri; Des Moines, Iowa; Peoria, Illinois; Milwaukee, Wisconsin; Akron, Ohio.

By May 15 the schedule of 24 conferences beginning July 1 to October 1 will have been completed. For each area and conference a chairman will be appointed and this chairman will be either a dealer, jobber or manufacturer. Interests identified with the warm air industry in each area will be invited by the area chairman to participate in arrangements for student attendance at the conference. If you are interested in a two-day Application Engineering Conference or in some instances a one-day conference, we suggest that you put your bid in now. A minimum of 30 students for each conference will be required with a preferred maximum of 100.

Registration Fees

A complete kit, including loose-leaf binder, copies of all Association technical publications and forms, pencils, drawing board, house plans and other items valued at $5.50 are included in the registration fees. Registration fees will be made payable by check or money order to the National Warm Air Heating and Air Conditioning Association and mailed or turned over to the area chairman.

Building commissioners, inspectors or other city officials, will be invited to attend the various conferences as guests of the Association. Gas, coal, oil and electric interests in each trading area conference will be invited to send their representatives and a very cordial invitation will be extended to architects.

Guy A. Voorhees is a man with a rich background of practical experience in the warm air heating industry.

He has had more than 35 years of practical warm air heating experience, including shop and installation. During this period he has been a heating contractor, an engineer, manufacturers' representative, and sales manager. He is registered in the State of Indiana as a professional engineer and is a member of the American Society of Mechanical Engineers, American Society of Heating and Ventilating Engineers, the National Society of Professional Engineers, and the National Federation of Sales Executives.

Mr. Voorhees has been a member of the Installation Codes Committee of the National Warm Air Heating and Air Conditioning Association for about fifteen years; a member of the Codes Committee of the Furnace Fan Manufacturers Association.

During the past twenty years he has written a great many articles for the trade papers and a number of technical bulletins for several manufacturers of warm air heating equipment. He is also the co-author, with Professor S. Konzo, of various sections of the Association's textbook, "Practical Warm Air Heating."

He was one of the first instructors to teach dealer classes when the original Standard Code was adopted about twenty-five years ago.

NEWS SUMMARY OF THE MONTH

Surplus Machinery

CONTRACTS have been signed with 500 machinery manufacturers, dealers and distributors who will act as Government agents in the resale of Government-owned surplus machine tools and production equipment under the redistribution program announced by the War Assets Corporation.

To accelerate the redistribution and conversion of the vast quantity of Government surplus machine tools and equipment into civilian production, approved dealer-agents are paid sales commissions equal to 12½ percent of Government disposal prices.

Previous to the inception of the approved dealer plan, $137,444,000 worth of the $660,375,000 of machine tools and production equipment declared surplus through December 15, 1945 had been sold for $71,693,000. This is exclusive of an estimated additional $495,000,000 in the inventory of plants, declared surplus, which may be sold as units with the plants.

Progress of this disposal is given in the following figures showing sales against inventories of 5½ months of 1945:

	Acquired for	Sales	
Accumulative thru June	*Disposal*	*Cost to Govt.*	*Sold for*
30, 1945 ...	$214,902,000	$75,550,000	$43,934,000
July	14,673,000	6,418,000	3,158,000
August	13,891,000	5,647,000	2,095,000
September ...	41,097,000	5,828,000	1,996,000
October	107,170,000	12,094,000	5,299,000
November ...	146,720,000	16,467,000	7,702,000
Dec. ....1-15.	121,922,000	15,440,000	7,509,000
Total thru Dec. 15, 1945 ..	$660,375,000	$137,444,000	$71,693,000

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LETTER TO CPA

Mr. Wilson Wyatt, Administrator
National Housing Administration
Washington, D. C.
Dear Mr. Wyatt:

You are interested in seeing that nothing stands in the way of building 1,200,000 veterans' housing units in 1946. We, in the warm air manufacturing industry believe the same thing.

Following are the impediments:

1. Adequate price incentive.
2. Ample raw materials.

As of today, OPA has indicated that it is prepared to issue price relief order to the following effect:

(a) To grant price relief at once on those sizes of furnaces required for the Veterans' housing program; sufficient in general to cover operating costs as of October 1, 1945.

(b) To entertain individual applications from those manufacturers for whom the above industry-wide adjustments are not adequate.

(c) Within 8 weeks to grant further industry-wide relief to cover additional labor and material costs incurred since October 1, 1945.

Relative to the second impediment to full production of warm air furnaces for Veterans' housing program, CPA has recently declared this product critical and is preparing to place furnaces on Schedule "A" of priorities Regulation 33.

The warm air manufacturing industry has the capacity with adequate price incentive which seems to be forthcoming, to produce with its existing facilities the full requirements of our products as currently estimated by the Plumbing and Heating Division of CPA. (At the present time the industry is operating at substantially less than 50% of its existing potential capacity.)

Principal thing that stands in the way now of maximum utilization of our industry's production facilities, is lack of sufficient materials, namely: light gauge galvanized sheets, light gauge cold rolled sheets, light and heavy gauge hot rolled sheets, pig iron, fractional h.p. electric motors, controls, blowers and other metal accessories.

You are the one who can make this material available. It requires positive action immediately in the form of no less an instrumentality than a directive to channel the flow of steel to the manufacturers of these critical products: furnaces, pipe, fittings, duct work, registers and grilles.

The above is respectfully submitted to you for your immediate consideration by the following manufacturers who represent a substantial percentage of the production of warm air heating products.

Yours very truly,

Wise Furnace Co.	Armstrong Furnace Co.
Lennox Furnace Co.	Williamson Heater Co.
American Rad. & Stand. Sanitary Corp.	International Heater Co.
	C. A. Olsen Mfg. Co.
L. J. Mueller Furnace Co.	Henry Furnace Co.

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Unionizing Foremen

"THE National Labor Relations Board has struck a serious blow at efficient production and increased the threat of industrial strife by its decision on unionization of foremen."

Making this statement, Ira Mosher, chairman of the National Association of Manufacturers, terms the decision "a distortion of the objectives" of the National Labor Relations Act, and calls for immediate remedial action by Congress.

"A foreman can't serve two bosses," Mr. Mosher said. "It is ridiculous and naive to expect a man who is bossed by the union to supervise a company's employees who are members of the same union.

"Union officers and committeemen give orders to every union member. How can a foreman exercise any degree of supervision over the same people who give him his orders from union headquarters?

"This bureaucratic decision takes away from management its key representative in the plant, and changes the foreman's approach to every problem.

"Undivided loyalty to management and its responsibility for efficient production certainly cannot be expected from a man who is forced to take an oath to promote the union's interests first, last and always."

Subsidies—Pro and Con

HOW to keep the price of new homes down and how to build them faster by eliminating the delay now caused by building materials shortages is developing a struggle in Washington between backers of a material subsidy plan and manufacturers who are arguing for price increases on certain key building materials, according to the N. Y. Journal of Commerce.

Both sides in the struggle are demanding government action to stimulate increased production of building materials. Housing Expediter Wyatt has already gone on record as favoring a subsidy plan. Opponents of subsidies argue that the time required to place a subsidy plan into operation will only further delay the end of the nation's critical housing shortage.

The subsidy group believes that higher prices for building materials will result in higher prices for new homes. They point out that most veterans can not afford to purchase homes costing more than $6,000, and it is argued that a materials price increase of less than 20 per cent will raise the cost of a $6,000 home to between $6,500 and $7,000.

Economists of the building materials industry claim that an average increase of 10 per cent on materials prices will actually reduce the cost of new homes by 10 to 15 per cent. Stimulating production of materials by increasing prices, they claim, will wipe out the present black market which is increasing the cost of many new homes and will eliminate the costly delays on partially completed homes which are forcing contractors to charge higher prices.

Anti-subsidy backers contended that a subsidy plan will stimulate production in only those materials plants now producing at a loss or at a very small profit. Subsidies will not increase production in the old established plants because they would be paid only to new or marginal producers and to inefficient producers whose costs are high.

Subsidy backers point out that more building materials produced as rapidly as possible is all that will save the goal of the housing program. Subsidies will do this, they argue, because premiums will be paid only for increased production.

It is also contended that subsidies will stimulate total capacity production in both high and low cost plants, whereas price increases on building materials will materially help only those plants now able to produce at the lowest costs.

This fight for and against subsidies on building materials will be fought out to a finish, the Journal of Commerce states, when the Senate takes up the Patman housing bill.

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Family Partnerships

FAMILY partnerships will pay greatly increased income taxes as the result of a recent Supreme court decision. Internal revenue officials said that under the ruling many businesses which had tried to make returns as partnerships would be forced to revise their taxes upward and pay on a corporation basis.

The Supreme court heard two cases on appeal from Circuit courts. In both cases the companies involved claimed to be family partnerships, but had formerly been corporations and were assessed as such. This increased their excess profits tax to a far higher bracket than it would have been as partnerships. Circuit courts ruled for the firms in one case and against them in the other. The Supreme court ruling was against the firms in both.

The decisions said:

"There can be no question that a wife and a husband may, under certain circumstances, become partners for tax, as for other purposes. If the wife either invests capital originally hers or substantially contributes to control and management of the business, or otherwise performs vital additional services . . . she may become a partner as contemplated by the revenue act.

"But when she does not share in the management and control of the business, contributing no vital additional service, and where the husband purports in some way to have given her a partnership interest, the tax court may properly take these circumstances into consideration in determining whether the partnership is real within the meaning of the federal revenue laws."

In one case a manufacturer in Michigan dissolved his corporation when profits increased and gave his wife stock valued at $57,000. She, however, took no part in affairs of the firm. In the other case a husband took similar steps. Federal tax courts, before whom the cases were first laid, ruled against the taxpayers.

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Government's Bite

THE year 1925 was one of widespread prosperity. Industry was fully occupied and labor fully employed at fair wages. Building activity was at the highest level known and farm prices were high. The government spent 3.6 billion dollars. There was 19 dollars of other money paid out for every dollar disbursed by the United States treasury.

For the two New Deal years 1935 and 1939, the burocrats' take was 14.1 and 13.4 per cent. Mr. Roosevelt was engaged in "reflating" prices. The national administration was trying not to economize. But even then, there was between $12 and $14 of private spending for every dollar of public spending.

During the war, the government took 62 per cent of everything produced. Things were ordered in the grandest scale, with no mind for the cost.

As the war was the cause of the increase, the end of the war should have been followed by a prompt shrinkage of the size of the government nip out of the national income. But the reduction has been pitifully small. For all of 1945, the government spent 56.4 per cent of all the national income that was paid out in this country. That compares with 5 per cent in 1925 and 13 to 14 per cent in the New Deal reflation.

In the month of March, 1946, the government spent 4 billion 602 million dollars, or at the rate of 55 billion dollars a year. If he keeps at the March rate, Mr. Truman will spend as much in 1946 as Mr. Roosevelt spent in the first seven years of his free spending regime. The national income in March was 13 billion dollars. Truman is spending 36 per cent of the national income.

There is no economy in Washington. The waste creates the shortages and the inflation. The more the government buys of what is produced, the less there is for everybody else. Throwing 55 billion dollars a year into the markets to compete with the people's money has the same effect upon prices which such a sum from any other source would have. If Washington will reduce its bite down to 1925 proportions, or even to the proportions of the wasteful Rooseveltian period, there will be plenty left for the private citizen.

RESIDENTIAL AIR CONDITIONING

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

IT'S WHAT'S UNDER THE CASING THAT COUNTS!

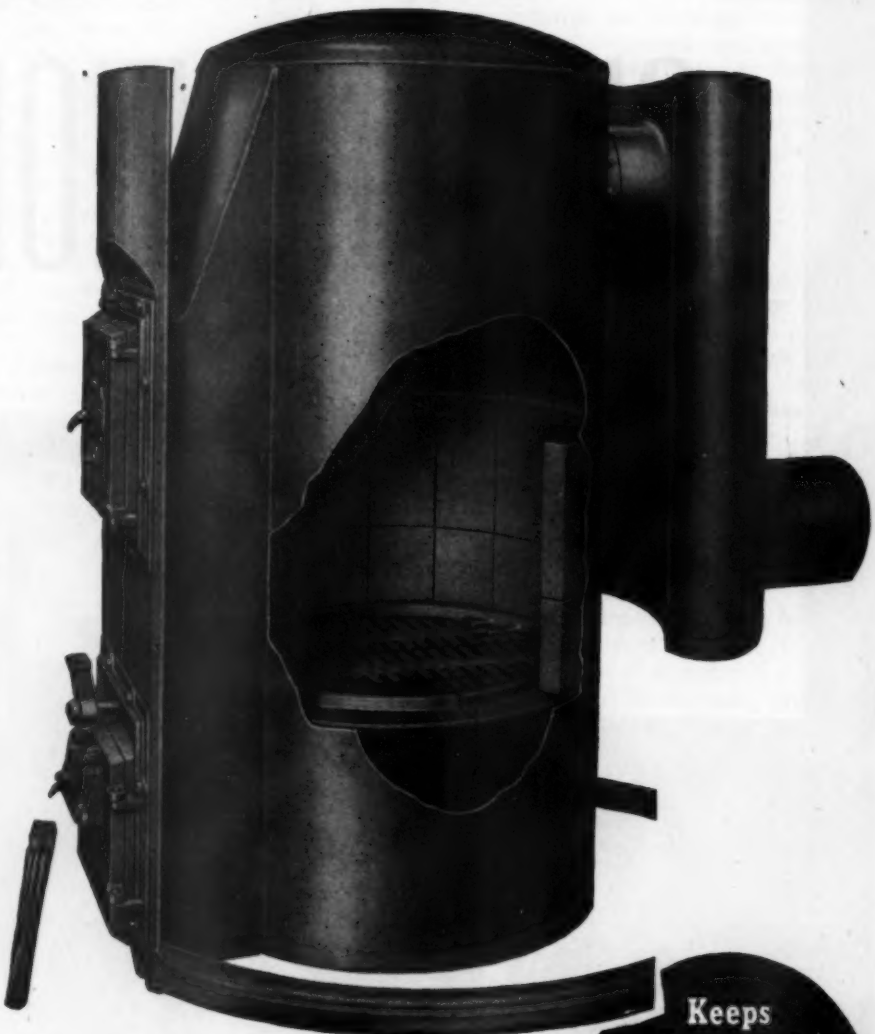
Waterbury

GASTITE FURNACE

We want to remind you that here are furnaces with a wide reputation for reasonable first cost—lower maintenance and operating cost—long life—absolutely clean, healthful heat. Models for all fuels and a range of capacities to serve all those homes which constitute your really profitable market.

And clean heat is the outstanding result of Waterbury construction. The body is made of heavy steel welded into one solid unit that is absolutely and permanently "gastite" — and while our first consideration is "what goes under the casing," our external designs give you a favorable start on every sale.

Waterbury Furnaces are also furnaces with a future—for the past several years we have been able to supply only a small fraction of the urgent demand.



Keeps Gases and Dust Out of the Heat Stream

THE **GASTITE** FURNACE

Moderate in Price
High in Quality

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E., Minneapolis, Minn.

A Gravity Heating Code In Ordinance Form

All over the country, in large cities and small towns, city building codes are now being permanently revised or temporarily amended to permit construction of the hundreds of thousands of homes the nation needs so badly. An important section of any city code is that part which specifies certain design and installation practices for warm air heating. Based upon the new "Gravity Code and Manual," the committees of the National Warm Air Heating & Air Conditioning Ass'n have also prepared an "Ordinance Form" which, if followed, insures design and installation fully in keeping with the industry's 25 years of research. This "Ordinance Form" is by far the simplest, best and most readily incorporated heating code now available. Contractors working for revision of city codes, or new codes, will do well to recommend that the gravity code which follows be incorporated verbatim in the city code. If legally permissible, a city code can be further simplified by just writing in (in effect) these words "Gravity warm air systems shall be designed and installed in accordance with the 'Ordinance Form' of the 'Code for the Design and Installation of Gravity Warm Air Heating Systems.' "

Intent of the Code

This Code is formulated to provide reliable methods of design and installation of gravity warm-air heating systems for buildings having heat losses not in excess of 150,000 B.t.u. per hour, and is prepared for inclusion in ordinances developed by municipal and local regulatory bodies.

In all cases where the term Manual is used, reference is made to the latest edition of the CODE AND MANUAL FOR THE DESIGN AND INSTALLATION OF GRAVITY WARM AIR HEATING SYSTEMS as issued by the NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION, 145 Public Square, Cleveland 14, Ohio.

Applicable sections of the STANDARDS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS (from N. B. F. U. Pamphlet No. 90, August 1942) shall be considered as integral parts of this Code, and are attached to the end of this Code. These Standards will be referred to as Underwriters Standards.

ARTICLE 1. DEFINITIONS.

Section 1.

Gravity warm-air heating systems shall consist of one or more warm-air furnaces, properly cased, together with necessary parts consisting of warm-air leader pipes and fittings, return-air ducts, risers, boxes, fittings, smokepipe or ventpipe, registers, return-air intakes and controls.

ARTICLE 2. ESTIMATING HEAT LOSS FROM ROOMS AND BUILDING.

Section 1.

The heat loss in B.t.u. per hour from each room to be heated shall be determined in accordance with the approved method given in the Manual, Section A. These values of heat loss are to be used in determining the required standard sizes of warm-air and return-air ducts, stacks or risers, fittings, registers, and return intakes.

Section 2.

The total heat loss from the building, in B.t.u. per hour, is the sum of the room heat losses, and is used to determine the size and capacity of the furnace required.

ARTICLE 3. SELECTION OF THE FURNACE.

Section 1.

The furnace shall be selected to satisfy the maximum hourly B.t.u. requirements of the building, in accordance with the method specified in the Manual, Section B.

Section 2.

All furnaces shall be rated in accordance with existing codes and methods recognized by the National Warm Air Heating and Air Conditioning Association. Ratings shall include both Bonnet Capacity and Register Delivery, in B.t.u. per hour. Register delivery is based upon a 25 per cent reduction from the bonnet capacity.

ARTICLE 4. SELECTION OF DUCTS, REGISTERS, AND INTAKES.

Section 1.

The selection of leaders, risers, fittings, registers, and intakes shall be made in accordance with the standard method outlined in the Manual, Sections C through F. Insofar as conditions permit, the stand-

ard sizes of ducts, fittings, registers, and intakes shown in Sections E and F of the Manual shall be used.

ARTICLE 5. INSTALLATION DETAILS.

Section 1.

In locating the furnace, due consideration should be given to:

(a) equalizing the length of the leader pipes.
(b) spacing the return air ducts equally around the casing,
(c) minimizing the length of the smokepipe,
(d) ease of firing and servicing the furnace.

Section 2.

(a) Furnace foundation of brick, cement, or other incombustible material must be provided. Said foundation shall extend at least 15 inches at rear and sides of furnace casing, and at least 36 inches in front of furnace casing. Foundation is to be level.

(b) Where it is necessary to place a furnace on a combustible floor, not less than 5 inches of hollow tile shall be used in every instance, having joints matched in such a way that air passage will be free from side to side, so that at no time will the removal of ashes or the handling of coal close up these openings. Such foundation shall be constructed upon, and covered with continuous sheet metal plates, of not less than No. 24 gauge metal, having all joints substantially riveted or double seamed and the bottom sheet to have the edges turned up at least one inch. This floor covering shall extend under the whole of the firebox and ashpit of the furnace and outwardly not less than 12 inches on all sides and rear of casing or base ring and 36 inches in front.

Section 3. Setting or Assembling of Furnace.

(a) The base ring of any portable warm-air furnace shall be cemented to the foundation, and cement flushed around the inside of the base rings, making an air-tight joint. The furnace parts shall be assembled plumb and level and in a workmanlike manner.

(b) All sections and joints shall be properly fitted. Joints requiring cement shall be well fitted and all bolts shall be drawn up tightly.

Section 4. Casings.

(a) Warm air furnaces shall be enclosed in metal casings.

(b) Sheet metal casings, including casing tops or bonnets shall be made of metal sheets not lighter than 26 U. S. Standard Gauge. They shall fit the castings and casing rings closely, so as to be dust tight and shall be securely fastened to the front. The casing shall be lined from the upper casing ring down to a line on a level with the grate.

(c) When side collars are used the casing top or bonnet must be of sufficient height so that the largest warm air pipe can be taken from side without ovalling. In no case shall a distance less than 8 inches be maintained between the top of the furnace and the bonnet.

(d) Any furnace, the casing top of which shall come within 12 inches of a combustible floor, ceiling or joist, shall be protected by a metal shield, extending not less than 18 inches beyond the casing of said furnace. This shield shall be suspended at least 2 inches below woodwork, allowing free air space between shield and woodwork. No furnace casing or top, coming nearer than 6 inches of ceiling or joists shall be allowed in any case. All metal casing tops shall be insulated with an air space or covered with magnesia, asbestos boiler covering, or sand.

(e) Openings for side casing collars shall be cut into the casing top or bonnet, so that the tops of all openings are on a level. Casing collars shall be fitted into place with a flange, or bead on the outside and drawn up on the inside, making a dust-tight joint. All collars shall not be less than the same size as the warm air pipes to which they are to be connected.

Section 5. Warm Air Pipes in Basement.

(a) All warm air pipes shall be constructed entirely of noncombustible material equivalent in structural strength and durability to the following:

Diameter Inches	Minimum Weight of Tin	Minimum Thickness of Galvanized Iron
Less than 12	IC (107 lb.)	30 U. S. gauge
12 or more	IX (135 lb.)	28 U. S. gauge

Side seams shall be locked seams. All joints shall be either seamed or lapped not less than 1½ in. Such joints shall be match-beaded or beaded. All pipes and fittings shall be properly secured to ceiling or joist.

(b) All warm air pipes in the basement should preferably have an upward pitch of 1 in. per running foot, but in no case should the pitch be downwards from bonnet to boot.

(c) All warm air pipes in the basement shall be provided with dampers supported on both sides and as near the casing as possible.

(d) Where warm air pipes pass through a masonry wall a metal thimble shall be provided, having a diameter at least 1 in. greater than the pipe, and pipe supported in such a manner that the air space is uniform on all sides. The air space may be filled with non-combustible insulation.

(e) Where warm air pipes pass through or into unheated spaces separated from the furnace room, they shall be insulated with not less than three layers of air cell asbestos paper or installed with an equivalent insulating substitute.

(f) All applicable provisions in the Underwriters' Standards shall be followed. (See Section 310 "Warm Air Supply Ducts.")

Section 6. Wall Stacks or Risers.

(a) Warm air risers shall be constructed entirely of non-combustible material equivalent in structural strength and durability to the following:

Width Inches	Minimum Weight of Tin	Minimum Thickness of Galvanized Iron
14 or less	IC (107 lb.)	30 U. S. gauge
over 14	IX (135 lb.)	28 U. S. gauge

(b) All applicable provisions in the Underwriters' Standards shall be followed. (See Section 310 "Warm Air Supply Ducts" which give provisions for both single-wall and double-wall construction.)

(c) All risers shall be braced in a proper manner so as not to obstruct the flow of air but to retain the full capacity throughout.

Section 7. Registers.

(a) When baseboard or wall registers are used, they shall be properly sealed to the stack head in such a manner as to prevent any leakage of air between the head and the register.

(b) Registers for warm air, and warm air pipes,

stacks and fittings shall not be located in outside walls unless properly insulated with 1 in. air cell covering or its equivalent on the cold side.

(c) For any system having not more than two warm air openings, at least one of these openings shall be without valve or louvers and the pipe thereto shall be without damper.

(d) All applicable provisions in the Underwriters' Standards shall be followed. (See Section 322.)

Section 8. Return Air Supply Furnace.

(a) The selection of ducts, risers, fittings and intakes on the return air side shall be made in accordance with the standard method, outlined in the Manual, Sections C through G. Returns should be short, direct, and with least number of turns and restrictions.

(b) All applicable provisions in the Underwriters' Standards shall be followed. (See Section 360 entitled "Cold or Return Air Ducts.")

(c) The air supply to the furnace may be taken from within the building or may be taken partially from outside and partially from within. All joints in the duct system shall be made dust tight.

(d) Where a boot or shoe is connected to the casing at the base, the opening shall not extend higher than a line on the level of the top of the grate of furnace. The width of the shoe shall be of proper measurement to make the area at all points at least equal to that of the round or square pipe. This boot or shoe shall be of streamline transition construction.

(e) Wherever the space between joists is used to convey return air over head, all bridging and bracing shall be removed and a dust proof sheet metal bottom shall be constructed. If more area is required two or more spaces may be used, or a pan may be constructed to extend below the joist to obtain the required area. The connection from this pan to the boot or shoe shall be made of galvanized iron not lighter than No. 26 U. S. Standard Gauge, shall have a transition fitting the top area of which shall be at least 10 per cent greater than the area of the connecting pipe. To reduce friction and for the sake of cleanliness, it is recommended that the joists and all wooden surface between such joists be lined with metal.

(f) The return-air face, or faces, shall be made of metal. Where return-air face is placed in a seat or side wall (whether furnished by owner, general contractor, or furnace contractor) the open work of face must extend to within at least 1 inch of the floor line and not more than 14 in. high.

Section 9. Smoke Pipes.

(a) The smoke pipe shall be as short and direct as consistent with the location of the furnace. It shall be made of metal not lighter than No. 24 U. S. Standard Gauge, and not less than the full size of the collar on the furnace throughout its entire length. It must have no opening for attaching fireplace, stove, range, water heater, gas or ventilating connection. It shall be lock seamed or riveted, all joints shall lap not less than 1½ inches and it shall be rigidly secured. Cast-iron smoke pipe may be used.

(b) All smoke pipes shall be provided with check dampers, placed on the side of the pipe or at the end of a tee; when cast-iron smoke pipe dampers are used they must be placed between the check damper and the furnace and supported on both sides of the pipe.

(c) Where the smoke pipe enters the flue, a thimble shall be cemented into the flue and the connections thereto made air tight. Should any smoke pipe come within 18 inches of any combustible material, such combustible material must be covered with asbestos paper, and a metal shield so fastened that a 2 inch air space exists between this shield and the combustible material. This shield shall be no less in size than twice the diameter of the smoke pipe and of sufficient length to cover the combustible material at all points.

(d) No smoke pipe shall project through any external wall or window. No furnace connection is to be made to a flue without a cast-iron or steel cleanout having first been provided in the flue.

ARTICLE 6. PIPELESS FURNACES.

(a) When but one duplex grating is used for both warm air and return air in a so-called pipeless furnace, the area of the return-air intake shall be at least equal to the area of the warm-air outlet of the grating. Art. 5, Sec. 4, relative to casings shall not govern when this type of furnace is installed, but the following specifications shall be followed: The inner casing of this type of furnace may be made of either black or galvanized iron not lighter than No. 26 U. S .S. Gauge. The outer casing must be made of galvanized iron not lighter than No. 26 U. S. S. Gauge. A uniform air space shall be maintained at all points between the inner and outer casing. In no case shall the top of the heater be allowed closer than 12 inches to any ceiling or joists above the furnace.

(b) Where joists are cut to accommodate this furnace, headers shall be put in and braced.

(c) Article No. 4 for determining sizes of warm-air pipe shall not govern in figuring a pipeless furnace.

(d) Where one warm-air register face is used and separate face or faces for return air supply are used, then Article No. 5, Section 8 shall apply.

ARTICLE 7. CHIMNEY.

The following provisions shall be made by the owner or building contractor in any building wherein a gravity warm-air heating system is to be installed. Provide a chimney for the furnace, constructed in a manner to comply with the following specifications:

(a) The chimney must be absolutely smoke tight throughout its entire length, and must extend at least 3 feet above a flat roof or 2 feet above the ridges of peak roofs.

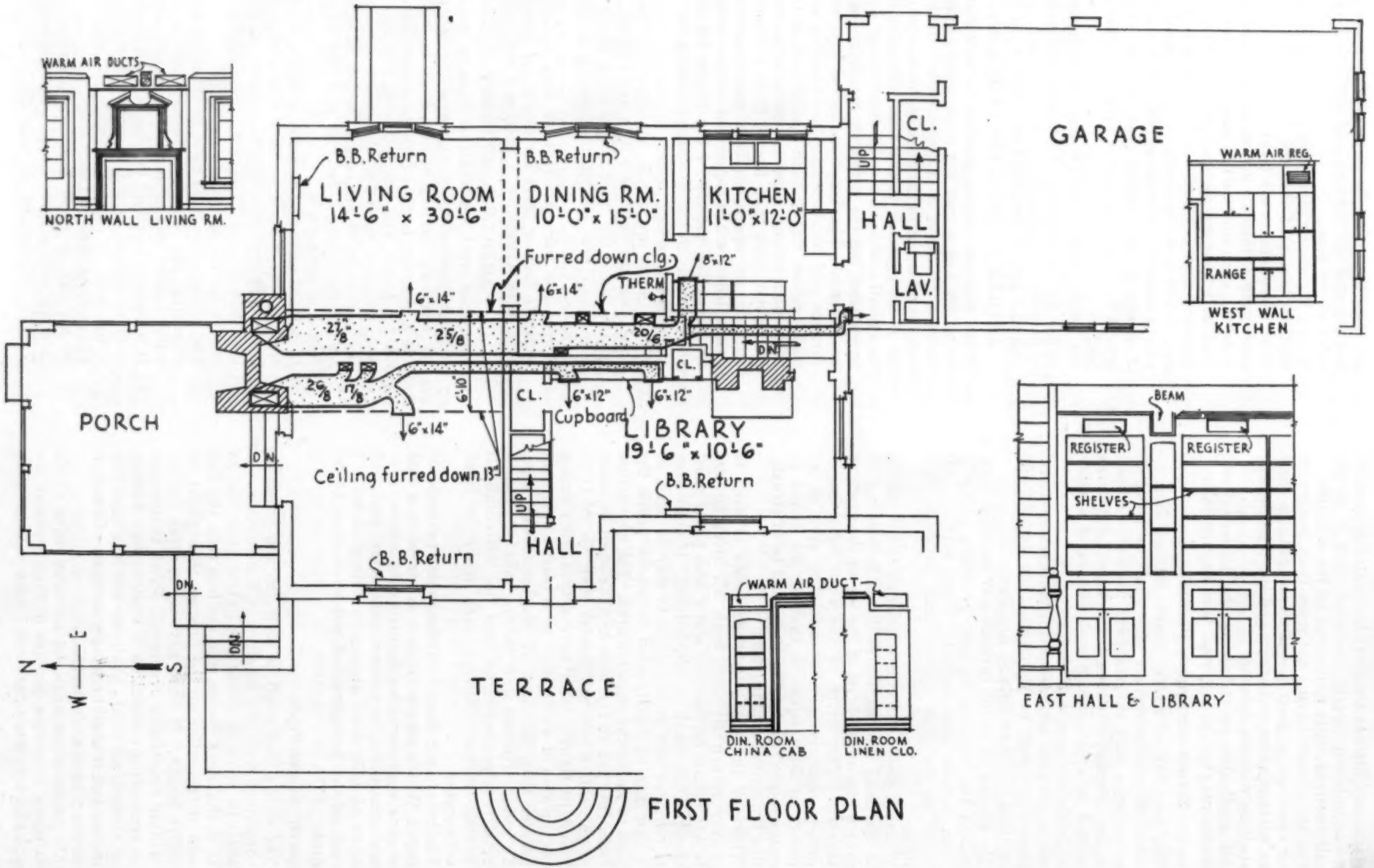
(b) If built of a single thickness of brick or of concrete blocks it shall be lined throughout its entire length with fire-clay flue lining, having not less than ¾ inch thickness. Flue linings to be laid in mortar and made air tight.

(c) The furnace flue must have no other opening for attaching any fireplace, furnace, stove, range, water heater, gas or ventilating connection.

(d) If necessary to offset the flue it must be done in such a manner as not to reduce the cross sectional area or create a ledge or obstruction, where loose material may lodge.

(e) Where two or more flues are included in one chimney they must be completely separated from

(Continued on page 142)



FIRST FLOOR PLAN

SUPPLY RISERS IN OUTSIDE CHIMNEY

A. C. KLOPF & SON, heating engineers and contractors of Saginaw, Michigan, recommended, designed and installed a winter air conditioning system in a 75-year old farm house which demonstrates how seemingly impossible structural conditions can be overcome if the owner and architect will cooperate and the heating engineer exercises some original thinking.

When the new owners bought the old farm house, they called in Klopf and asked if a modern winter air conditioning system could be installed. The difficult conditions quickly brought to light were these: the old basement was brick floored with only 6 feet 6 inches clear headroom which was to be reduced by addition of a new concrete floor; the owners wanted to use the basement for laundry and other purposes so there was no head room for ducts; the registers and returns of the old gravity furnace were all in the floors—high side wall registers were requested; many of the old rooms were not heated; several new rooms were made by moving or adding partitions and these new rooms had to be heated.

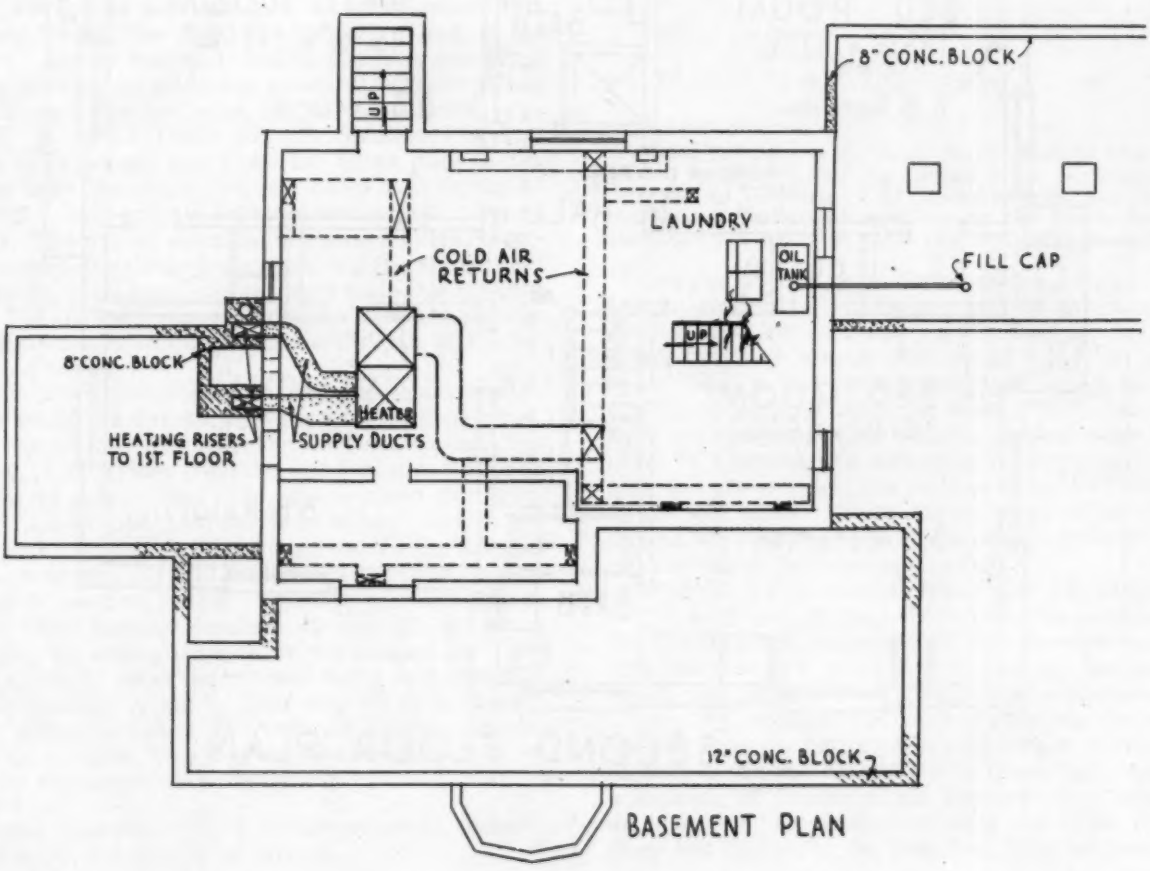
Klopf recommended an oil fired, winter air conditioning unit with a capacity of 190,000 Btu per hour from a 1.65 gallon nozzle; with the blower delivering approximately 2,000 cfm. The oil tank is in the basement with the fill opening in the garage (see basement plan).

The difficult problem was how to keep the basement clear of ducts. This was solved by placing the heater at one end of the basement, close to a new chimney, and running two short heat mains through the basement wall and into the new chimney. Klopf convinced the owner and architect that this idea was both feasible and practicable; so in designing the new chimney, two spaces were left alongside the flues as shown on the basement and first floor plans. These risers in the chimney are metal, covered with ½-inch of "Duxsulation"; after erection and covering of the risers the brick and block were laid up.

Mains Concealed End to End

These risers go up to the level of the first floor ceiling. At this level the risers convert into horizontal supplies (see first floor plan) by means of suitable fittings and again pass through the outside wall into the living room.

The first floor plan does not show the alterations to the inside of the house, but the plan and details do show how the two main supplies are taken through the house from end to end completely concealed by furred down ceilings or behind new, built-in cabinets, closets, cupboards, etc. It required complete cooperation between owner, architect, carpenters, and Klopf to get this work installed in proper sequence—but it was done. *(See First Floor Plan Facing)*



BASEMENT PLAN

The house was divided for heating purposes into two parts; roughly the front and the back of the house. One main supplies each part. The two mains pass across the living room alongside a new support beam and are concealed by furring down the ceiling 13 inches. This furred down ceiling is 6 feet 10 inches wide. Not all this space is required for the ducts. To heat the living room, two registers are placed at the center point of the furred down ceiling; one register being taken from each supply main. These registers are directional flow (two way).

Stub Branches Connect Registers

The main for the front of the house continues through the living room-hall partition; through a coat closet and a new cupboard in the hall; then through another partition and through more cupboards in the library. Stub branches connect one register in the hall and one register in the library to this main. Thus the only part of the heating system which shows in these rooms is the register.

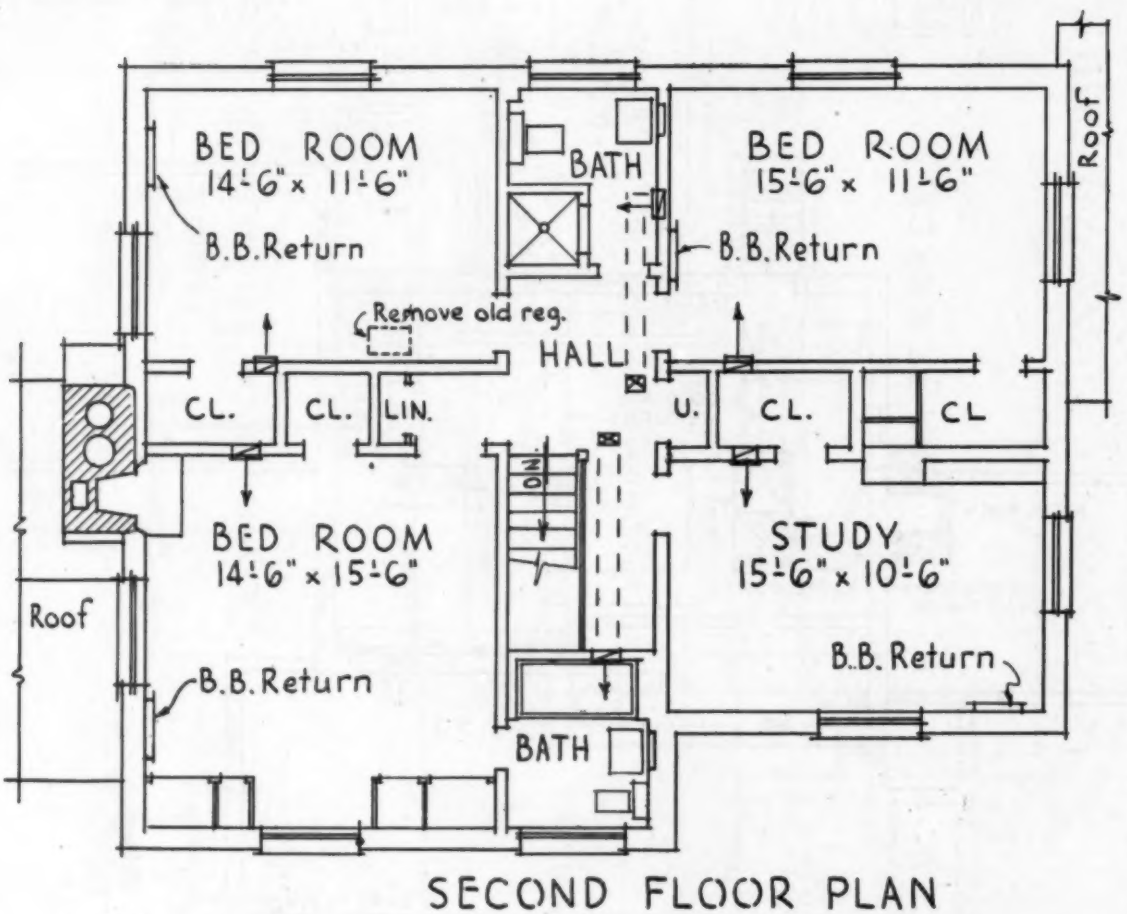
After crossing the living room, the main serving the back of the house is concealed by a china cabinet and linen closet and a furred down ceiling in the dining room (see details) and passes through the basement stairs to heat the back stairs hallway. Stub branches off this main heat the dining room, the kitchen and the back hall as shown in the first floor plan. Thus the only section of these two mains which shows is the short run through the basement stairs.

To heat the second floor rooms, stubs were taken off the same mains and short risers connect with baseboard registers in the three bedrooms and the study. To heat the two bath rooms, horizontal branches pass between joists of the second floor to partitions; then risers go up partitions to registers in the high side wall—over the tub in one case and facing the shower stall in the other.

The return system shown on the first and second floor plans was installed all new, using baseboard returns which drop to collecting mains alongside the outside walls of the basement and panned joist spaces. The only head room taken in the basement, then, is up against the outside walls.

Single Zone in Operation

In operation, the entire house acts as a single zone from one thermostat located in the dining space. The thermostat starts and stops the oil burner. A fan switch in the bonnet starts the fan at 150 degrees and stops the fan at 110 degrees. The limit control was set for 175 degrees. After the system was put in operation it was found that the operating cycles were too frequent so the speed of the blower was reduced; this reduced the volume of air introduced and served to cause the fan to operate on longer cycles. Failure of the burner is avoided by a protecto-relay.



SECOND FLOOR PLAN

The "How, What and Why" of the New Winter Air Conditioning Manual

BY
S. KONZO*

HOW TO USE IT
WHAT RESEARCH BACKS IT UP
WHY EVERYBODY SHOULD ADOPT IT

How Tables 8 and 9 Were Established

The following detailed explanation is for the student who desires to know how the tables of "Combination Numbers" were derived, and what assumptions were made by the writer in the extended calculations that had to be made in setting up the capacity tables. This explanation is the first time this explanation has appeared in print. Keep it as a reference even though some of the explanation may appear a bit complex at first reading.

IN preparing the simplified design tables shown in the Manual No. 7 we have made use of the best available information concerning such matters as frictional resistance, temperature drop in ducts, allowable static pressures, etc. We shall not attempt to go into each and every step in the derivation, which filled two large notebooks with calculations. We shall merely attempt to outline the procedure we used and to demonstrate the fact that the tables are based on acceptable engineering practice. *You should understand that this recital of all the detailed steps is not an explanation of the steps that you will have to take*—rather this mortification of the soul was what we had to go through. Briefly stated, it shows you how much fun you are missing by using the short-cut capacity tables in the Manual. So just relax and enjoy yourself.

STEP 1. STANDARD STACK SIZES.—The bottleneck in a branch line from the trunk duct to the register is in the stack. We had noted that depths of stacks of 3, 3¼, and 3½ in. were being made prior to the war. The 3½ in. stack did not give sufficient clearance between the sides of the stack and the stud space; whereas the 3 in. stack did not have quite the capacity of the 3¼ in. stack. In consultation with the fittings manufacturers, therefore, a *standard depth of 3¼ in. was selected.*

In the initial calculations made by us, stack widths of 6, 8, 10, 12, 13 and 14 in. were tentatively selected. Later, the fittings manufacturers decided to omit the 6, 8, and 13 in. widths from the standard size list. For purposes of calculations only, we retained the 6 in. width since we had need for it in a later section devoted to the sizing of the trunk ducts. In the Manual Tables, however, you will find that the minimum size of stack is listed at 10x3¼. This size of stack applies to both Combination Numbers 41 and 42. In strict confidence, the capacities listed in the Manual for Combination No. 41 were determined for a fictitious and non-standard 6x3¼ stack. This may serve to explain why it is that we show two capacity listings for the same size of stack. This may become clearer to you in the later discussion on trunk sizing.

**Special Research Professor, Engineering Experiment Station, University of Illinois.*

STEP 2. EQUIVALENT DIAMETER OF STACKS.—As shown in Table I, Combination Numbers 41 to 46 were assigned to six stack arrangements, involving three sizes of stacks. The values in the third column show the "equivalent diameters" of round pipes for each of the stack sizes. In other words, a 12x3¼ stack has the same frictional resistance per foot of run as a 6.6 in. diameter round pipe.

Table I.
Combination of Number, Size, and Equivalent Diameter of Stacks

Combination Number (1)	Stack Size (2)	Equiv. Diameter of Round Pipe, Inches (3)	Actual Size of Branch Duct to Be Connected to Stack	
			Round (4)	Rectangular (5)
41	(6x3¼)*	(4.8)*	6	4x8
42	10x3¼	6.1	6	4x8
43	12x3¼	6.6	7	5x8
44	14x3¼	7.1	8	6x8
45	10x3¼ (2-stacks)	Two-6.1 in.	9	8x8
46	12x3¼ (2-stacks)	Two-6.6 in.	10	10x8

**Used for calculation only. In the Manual this has been replaced by the 10"x3¼" size, which is the minimum size of stack adopted by industry. This fictitious stack size was used primarily to take care of additions to the trunk duct that were less than the additions required for Combination 42.*

Columns 4 and 5 show the recommended sizes of the branch ducts to be connected to each of the stack sizes. For example, for Combination Number 43, the recommended size of branch duct would be either a 7 in. round pipe, a 5x8 rectangular duct, or of course, a 12x3¼ rectangular duct. In other words, these three sizes are equivalent sizes and can be used interchangeably. In a branch line consisting of horizontal branch pipe and a wall stack, the bottleneck in the line is still in the wall stack. Hence, for purposes of later calculations, we used the values in Column 3 of Table 1, and not the values in Columns 4 and 5.

STEP 3. C.F.M. CAPACITIES OF EACH STACK.—The next step in the calculations was to determine the air handling capacities of each branch run. For this purpose we made the following assumptions, which are consistent with engineering practice:

(a). We assumed that each branch was an individual run from the bonnet of the furnace to the register. If part of the run consisted of a trunk duct supplying a number of branches, we assumed that there was an imaginary single duct running the entire distance from the bonnet to the register. This assumption is

valid if the size of the trunk duct actually used is based on having the same friction loss per foot of run as that for the branch duct. In any case the assumption is on the safe side.

(b). We assumed that the total static pressure available at the inlet and outlet of a combination blower-furnace assembly was 0.20 in. of water gage. As explained in an earlier article, present test codes for rating furnaces are based on the available static pressure to overcome pressure losses in the entire distribution system.

(c). We had the choice of dividing this 0.20 in. available pressure between the warm air supply side and the return air intake side. There existed no good reason for specifying a greater pressure loss on the warm air side than for the return air side. As a matter of fact, since we were desirous of obtaining a set of capacity tables that would apply to both warm air and return air sides, the only logical course was to assume that 0.10 in. pressure would be available on each side of the furnace-blower assembly. In other words, we assumed that we had available a 0.10 in. static pressure for giving the air the "oomph" necessary to deliver it from the bonnet to the register, and an equal pressure to return it from the intake opening to the blower cabinet.

(d). We now have part of the information required to make use of the common friction chart. (A detailed explanation of the friction chart and its use is given in the book "Winter Air Conditioning" by the writer, and will not be given here.) If we have an available pressure of 0.10 in. and we have a total duct length of 100 ft., then the unit friction loss is equal to 0.10 in. per 100 ft. of run. Also if the run is 200 ft. the unit friction loss is equal to 0.10 divided by 2, or 0.05 in. per 100 ft. of run. Table 2 shows the unit friction losses for a wide range of duct lengths.

Table 2
Unit Friction Losses Used in Calculations

Total Duct Length, Bonnet to Register, in Feet	Total Available Pressure, Inches, Water	Unit Friction Loss, Inches Per 100 Feet of Duct
(1)	(2)	(3))
50	0.10	0.20
100	0.10	0.10
150	0.10	0.067
200	0.10	0.05
250	0.10	0.04
300	0.10	0.033

(e). By using the values in the third column of Table 2 and the equivalent diameters given in the third column of Table 1, we were in a position to work with the friction chart. The best available chart is that given in the A.S.H.V.E. Guide. (A revised chart is shown in the A.S.H.V.E. Transactions, Heating, Piping, and Air Conditioning Magazine, October-November, 1945.) Fig. E was derived from the friction chart, and gives the c.f.m. capacities of the branch pipes for varying lengths of the branch.

STEP 4. SETTING UP THE HEATING CAPACITY TABLES.—C.F.M. values alone do not give us heating capacities. Not only must we know the air volumes that will be delivered at each register, but also the approximate register temperatures. The latter is dependent on the *actual length* of the run from the bonnet to the register, whereas air volumes are determined by the *actual length plus the equivalent length of run* accounted for by the fittings and the register.

Temporarily we had to divert our attention to figure out a layout of the capacity tables that would enable us to separate the actual length from the equivalent

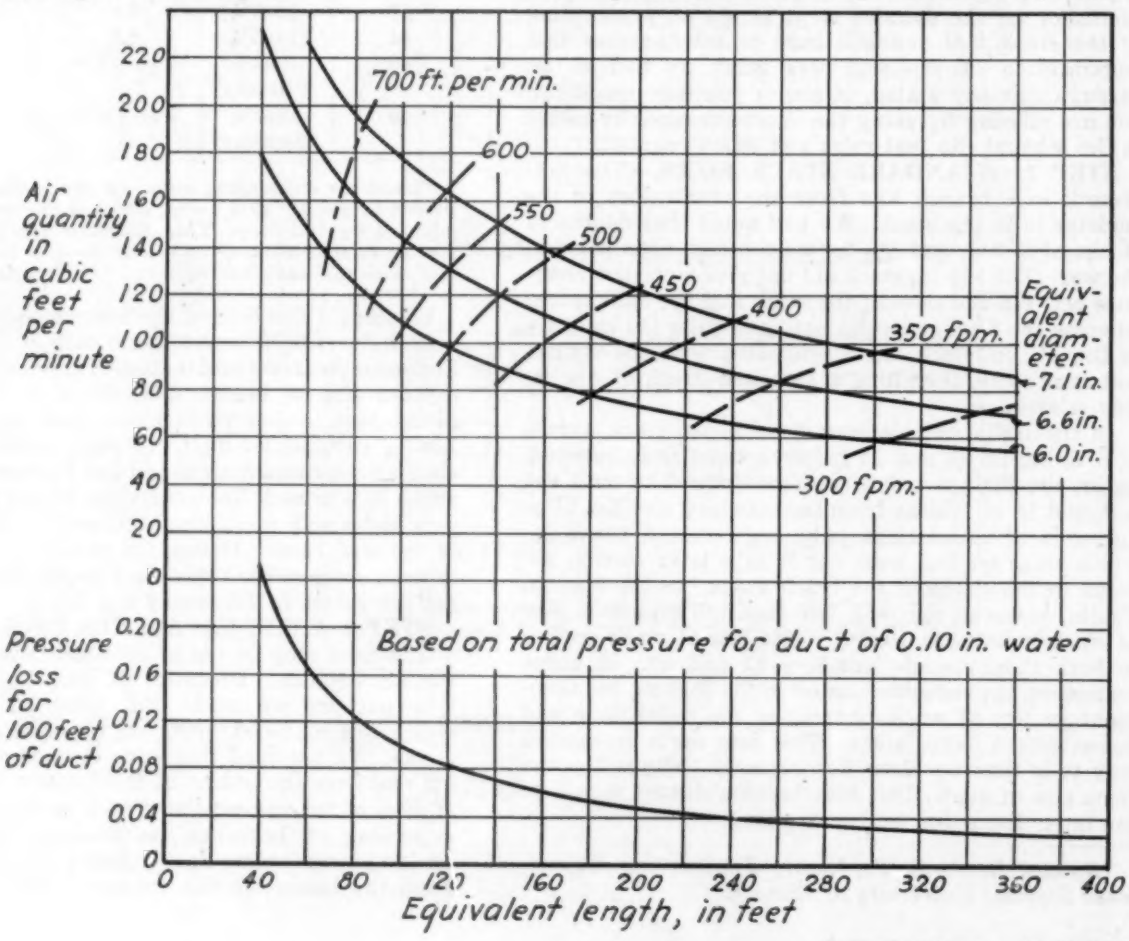


Fig. E

CAPACITY TABLES FOR WARM-AIR AND RETURN AIR BRANCHES

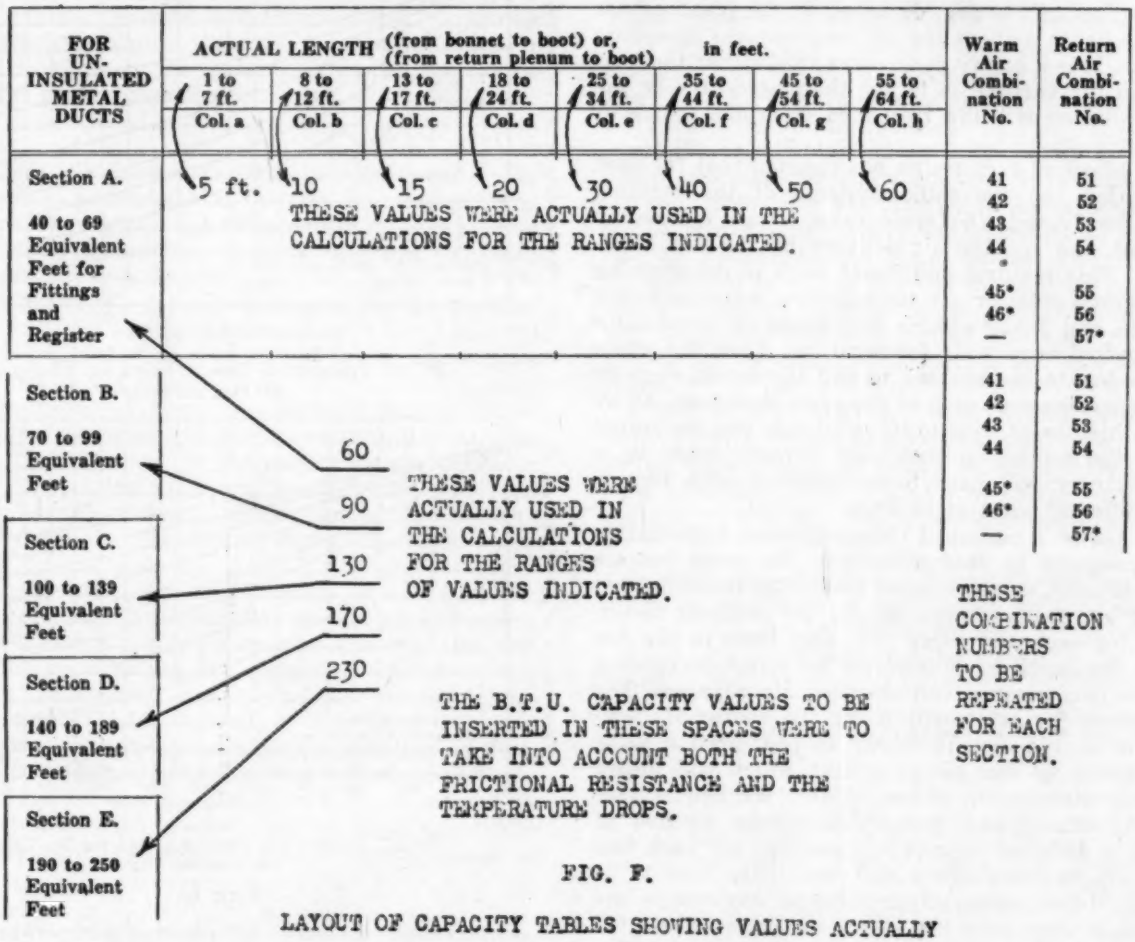

FOR UN-INSULATED METAL DUCTS
ACTUAL LENGTH (from bonnet to boot) or, (from return plenum to boot) in feet.
1 to 7 ft. Col. a
8 to 12 ft. Col. b
13 to 17 ft. Col. c
18 to 24 ft. Col. d
25 to 34 ft. Col. e
35 to 44 ft. Col. f
45 to 54 ft. Col. g
55 to 64 ft. Col. h
Warm Air Combination No.
Return Air Combination No.
Section A.
40 to 69 Equivalent Feet for Fittings and Register
5 ft.
10
15
20
30
40
50
60
41 42 43 44 45* 46* —
51 52 53 54 55 56 57*
THESE VALUES WERE ACTUALLY USED IN THE CALCULATIONS FOR THE RANGES INDICATED.
Section B.
70 to 99 Equivalent Feet
60
90
41 42 43 44 45* 46* —
51 52 53 54 55 56 57*
Section C.
100 to 139 Equivalent Feet
130
Section D.
140 to 189 Equivalent Feet
170
Section E.
190 to 250 Equivalent Feet
230
THESE VALUES WERE ACTUALLY USED IN THE CALCULATIONS FOR THE RANGES OF VALUES INDICATED.
THESE COMBINATION NUMBERS TO BE REPEATED FOR EACH SECTION.
THE B.T.U. CAPACITY VALUES TO BE INSERTED IN THESE SPACES WERE TO TAKE INTO ACCOUNT BOTH THE FRICTIONAL RESISTANCE AND THE TEMPERATURE DROPS.

FIG. F.

LAYOUT OF CAPACITY TABLES SHOWING VALUES ACTUALLY USED IN THE CALCULATIONS OF CAPACITIES.

length, and at the same time to take them both into account. After a number of preliminary trials it was finally decided that a table of the form shown in Fig. F would be most suitable. This arrangement is necessary because the *air temperature* at the register is largely dependent upon the *actual length* of the run and not upon the equivalent length of the fittings. Hence, the actual lengths of 5, 10, 15, 20 ft., etc., shown in the column headings are primarily for the purpose of determining the temperature drop of the ducts. Now the frictional resistance of the run is dependent upon both the actual length and the equivalent length, the latter of which is shown in the section headings to the left of the table. The sum of the two length values were used by us in determining the air volumes. After the layout of the capacity table was finally established, then we were ready to make the required calculations for the temperature drop in the duct.

STEP 5. PREDETERMINING BONNET TEMPERATURES—As explained in one of the earlier articles, the Manual is definitely tied in with existing furnace test codes and their limiting provisions. The allowable temperature rise of the air passing through a furnace-blower unit varies over a range of from 70 to 100 deg., with a large majority of the codes specifying a maximum temperature rise of 100 deg. F. For example, if the air returns to the blower at 65 deg. F., the maximum allowable bonnet temperature is 65 plus 100 deg., or 165 deg. F. Hence, in the Manual design method we do not require you to do a lot of preliminary figuring with air changes and average duct lengths in order to find the design value for the bonnet temperature. We have fixed this value at 165 deg. F.

You must understand that the temperature selected for the design bonnet temperature is not a critical value as far as duct design is concerned. We could have used 155 deg. or 175 deg. without greatly affecting the sizing of the ducts. The 165 deg. value may be considered as one of the anchor points of our design which enables us to size the ducts so that each branch will receive its proportionate share of heated air.

We realize from our studies of plant performance that under so-called design load conditions, we should reasonably expect a bonnet temperature that is less than 165 deg. For example, in our design procedure we assume that the only heat supplied to a room to offset the heat losses comes from the warm air from the registers. Actually, every warm air system has a large panel heating effect. The heat losses from the basement ducts and wall stacks is not lost from the house but heats the floor and wall surfaces. The heat from this indirect "panel" source reduces the heat requirements at the register. Even though we assume a design bonnet air temperature at 165 deg. we can expect in a properly designed and operated system that the bonnet air temperatures will be more in the neighborhood of say 150 deg. under design load conditions. Furthermore, it should be understood that the Manual method of blower operation insures that over about 80 per cent of the heating season the bonnet air temperatures will be maintained at about 110 to 140 deg. Only during prolonged pick-up periods or during

the few days of the season when the plant is operating at full load will the bonnet air temperature ever get up to values of 150 deg. or more. If the plant cannot heat the house without the air temperatures exceeding 150 deg., it is a pretty good index that either the heat input to the furnace is larger than necessary or the air circulation is being restricted from one source or another.

One school of duct design has insisted that for each installation (a) the cubic contents of the building should be figured, (b) some value of air circulation assumed, and (c) the air delivery by the fan determined. This requires additional work in determining the average register air temperature, average length of ducts, and finally after a long series of calculations the required bonnet air temperature. Then the whole process has to be reversed to find the actual register air temperatures at each of the many openings. If we follow this line of logic to its inevitable end we cannot escape the conclusion that each furnace made by a manufacturer will have to be supplied with two or three different sizes of blowers.

The use of a packaged blower-furnace combination is discouraged by this procedure. To state matters rather bluntly, we see no good reason for insisting that bonnet air temperatures should be precisely determined for each and every job. Our tests in the Research Residence have indicated no direct correlation between performance and so-called air changes. The only reason for arbitrarily fixing the bonnet air temperature at 165 deg. is merely to peg down a value from which we can design a duct which will insure equitable distribution of heated air. We believe that the long-winded and apparently precise method of stating a different bonnet temperature for each and every job is meaningless and has little relation to reality. Hence, unless much stronger arguments are brought to bear upon the point, we are standing pat with a fixed value of the bonnet air temperature.

STEP 6. PREDETERMINING TEMPERATURE DROPS IN DUCTS—Since we have arbitrarily fixed the design bonnet temperature at 165 deg., our next step was to determine the approximate temperature drop of the ducts leading from the bonnet to the register. Up until the time the Manual was issued, the prevailing practice was to assume a temperature drop of between one-fourth to one-third degree per foot of run. Observations in the Research Residence indicated that these values were inclined to be on the low side, particularly for branch runs. An extensive laboratory investigation was conducted, as reported fully in Engineering Experiment Station Bulletin 351. Four sets of working curves were shown in the Bulletin for varying air velocities in the ducts. Two of these four sets of curves are shown in Fig. G. It may be noted from these sample sets of curves that the temperature drop in a duct depends not only upon air velocity, but upon duct size, initial air temperature, duct length, and a few other factors that are explained in detail in the original report.

For the sizes of branch ducts corresponding to Combination Numbers 42, 43 and 44 in the Manual, the temperatures existing in the duct were determined from the basic data and are reproduced in Table 3.

The values given in Table 3 are probably on the conservative side, since the assumption is made that the individual branches are carried all the way back to the bonnet, whereas in actual practice part of the run may be in the form of a trunk duct. The bigger trunk ducts have a smaller temperature drop per foot of run than do smaller individual runs. On the other hand, a

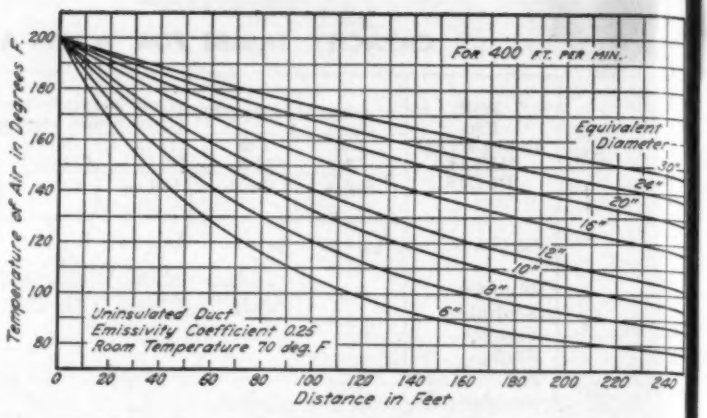


Fig. 10. Temperature Drop in Ducts for Air Velocity of 400 Feet per Minute

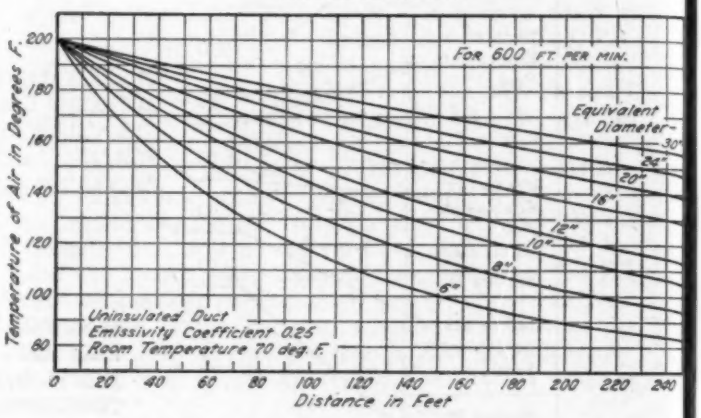


Fig. 11. Temperature Drop in Ducts for Air Velocity of 600 Feet per Minute

Fig. G

conservative estimate of register temperatures for long runs is justifiable, since many duct systems are based on individual runs. Furthermore, the rooms being supplied by such long runs are usually without benefit of the panel heating regain from the basement ducts running underneath the room. In addition, such long runs frequently pass through basement spaces that are markedly cooler than those nearer the furnace. In general, therefore, the use of temperature drops of the order of two-thirds to one degree per foot of run is much more defensible than the values of one-fourth to one-third degree per foot that were frequently assumed in the past. It should be noted that in the Manual we do not assume a single value for the temperature drop per foot of run. We use a larger value nearer the bonnet end of the duct system and use a smaller drop out towards the end of the duct.

Again it should be emphasized that the temperatures given in Table 3 are for maximum or design load conditions. By operating the blower in accordance with the Manual recommendations, namely, with the blower cut-in temperature of the order of 125 deg., the temperatures in the duct system will not be as high as those shown in Table 3 over a major portion of the heating season. If the blower is operated practically continuously for all weather conditions colder than about 40 deg., no difficulty will be experienced with unbalancing of room temperatures. Every room will be supplied with its proportionate share of heated air as long as the blower is operating. Systems which operate as booster gravity jobs cannot be made to balance uniformly, and there is no design method available that will take into account such a method of operation.

STEP 7. RELATION BETWEEN ROOM HEAT LOSS AND AIR VOLUME AT REGISTER. As shown in the volume "Winter Air Conditioning," a simple relation exists between the room heat loss and the air volume delivered at the register. This relation can be expressed by the equation:

$H = Q \times 1/C$

in which

H = heat loss from room in B.t.u. per hour.

Q = c.f.m. at register at the density corresponding to the register air temperature.

C = c.f.m. factor having units of c.f.m. for each B.t.u. per hour loss.

The coefficient, C, depends primarily on the register air temperature and varies from 0.0203 for a register temperature of 114 deg. to 0.0109 for a temperature of 165 deg.

For purposes of these precalculated tables, it was much more convenient to use the reciprocal of C, that is, 1/C. These values for the reciprocals are shown in Fig. H for varying air velocities in the duct and for various lengths of runs. The curves in Fig. H were derived from the register air temperatures given in Table 3.

STEP 8. DETERMINATION OF B.T.U. CAPACITIES—At long last, as the expression goes, we have brought together the two divergent elements that will enable us to calculate the capacities shown in the tables of the Manual. For this purpose we can ignore all the intermediate steps which have been discussed up to this point and concentrate our attention on Figs. E and H, together with Table 1. Fortunately, you will not have to do the actual work, for it was sheer drudgery multiplied several hundred times over. The procedure which we followed can be briefly stated as follows:

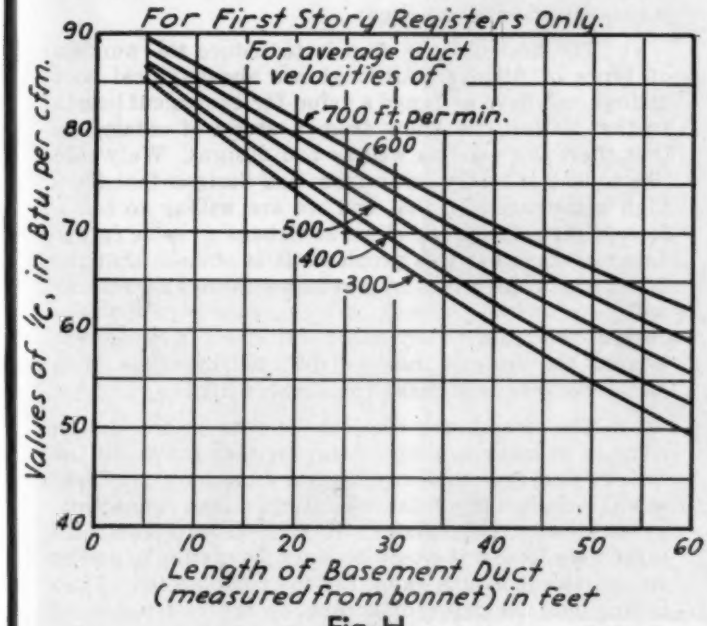


Fig. H

a) We selected a Combination Number such as No. 42.

b) We selected some actual length of the basement duct, of say 5 feet, and also an equivalent length for the fittings of say 60 feet. To the sum of these two values we also added about 3 feet to take into account the distance of the vertical stack height from the basement to a point about half way between a baseboard register and a high sidewall register. This is explained in more detail in step No. 9.

c) From Fig. E we could determine both the air volume and the duct velocity for this run of 68 feet. These values were jotted down in a work sheet.

d) From Fig. H we could determine for a 5-foot basement run the proper value for 1/C for Combination No. 42. This value was also jotted down in the work sheet in the proper space.

e) We then multiplied the c.f.m. value by the 1/C value and obtained the B.t.u. per hour capacity for the run. This value was inserted in the capacity tables.

The laborious procedure was repeated ad infinitum and ad nauseum. The B.t.u. values thus calculated were plotted on curves in order to catch any numerical errors. Rounded values were then read from the curves and were finally placed in the two capacity tables shown in the Manual, Tables 8 and 9 (February issue).

STEP 9. CAPACITIES FOR FIRST AND SECOND STORY REGISTERS—You may have observed in the Manual that we show a capacity table for first story register (Table 8), and another for second story register (Table 9). The question immediately comes

Table 3.

Air Temperatures at End of Branch Ducts (Bare Pipe)

(Based on data given in Bulletin 351 and for Combination Nos. 42, 43, and 44.)

First Story Registers

Average Air Velocities in Ducts, Ft. Per Min.	Length of Duct Measured From Bonnet, in Feet						
	0	10	20	30	40	50	60
400	165°	155	145	137	130	124	118
500	165°	156	147.5	140	133.5	127.5	122
600	165°	157	149.5	143	137	131.5	126
Second Story Registers*							
400	165	148.5	139	131	125	119	114
500	165	149.5	141.5	134	128.5	122.5	118
600	165	150.5	143.5	137	132	126.5	122

to mind as to whether these tables apply equally well to baseboard and high sidewall registers. The answer is that they do apply. Note above in explanation (b) under Step No. 8 that we added an extra 3 feet to the equivalent length to take care of the vertical stack. This is about 3 feet longer than is necessary for a baseboard register and about 4 feet shy of the length of duct leading to a high sidewall register. This difference of some 3 to 4 feet is a negligible amount compared to the total equivalent length, which was varied from 65 to 290 feet. The capacity tables for the first story registers are, therefore, also applicable to plants in which the furnace is on the first story, as in many utility room installations. In this case the tables give values slightly on the conservative side for registers located on the first story. The same table, namely, that labeled for first story alone, can also be used for the second story rooms of a house in which the furnace is located on the first story.

In the case of capacity tables for second story rooms (Table 9), 10 feet was added to the run to take into account the length of the vertical riser. For example, for a basement run of 20 feet and for an equivalent length of fittings of 60 feet, the total length used in connection with Fig. E was 20 plus 60 plus 10, or 90 feet. The c.f.m. values selected in this manner were located in the 20 column of the capacity table. In this case also the table is applicable to both baseboard and high sidewall registers on the second story.

The temperature drop in the risers leading to second

story registers was taken into account. For this purpose, the data from the Research Residence were studied and the temperatures shown in the upper part of Table 3 were reduced from about 4 to 7 deg. The register temperatures used in the calculations are shown in the bottom half of Table 3. The conclusion may be drawn that the differences in the capacities listed for first and second story registers were due to the fact that the second story runs were slightly longer and had slightly lower register temperatures as compared with those for first story runs.

STEP 10. CAPACITIES FOR COMBINATION NOS. 45 AND 46—Combination Numbers 45 and 46 were equivalent to two stacks of 10x3¼ and 12x3¼, respectively. It was considered sufficiently accurate, therefore, to assume that the capacities for these combinations would be twice those for Combination Nos. 42 and 43. The air carrying capacity for the "Combination" corresponding to the 12 in. duct was found from the friction charts to be about five times as great as that for the 6.6 in. diameter duct used for Combination No. 43. Hence, the B.t.u. capacities for Combination No. 57 were made five times as great as those for Combination No. 43 or its equivalent, No. 53.

STEP 11. INSULATED DUCTS—The headings at the top of the columns in Tables 8 and 9 show the actual lengths of *uninsulated* metal ducts. The question was raised as to how the tables could be arranged to take care of cases in which ½ in. thickness of insulation (corresponding to two layers of air cell asbestos) were used to cover the ducts from the bonnet to the boot connection. It should be clearly understood that insulation of ducts does not refer to one or two layers of asbestos *paper*, since such thin layers of asbestos paper increase the heat loss instead of conserving it in the ducts. For information regarding the effectiveness of insulation, data from the Research Residence were analyzed. It was found that the temperature drops from the insulated duct were about one-half of those for an uninsulated duct leading to first story registers and about 0.87 of those for an uninsulated duct to a second story register. The insulation was not as effective for the second story run as for the first story run, since only the basement portion of the duct was protected, and the heat savings thus effected by the insulation were offset to some extent by the greater heat loss in the stacks.

To make a long and complicated story as short as possible, we calculated the capacities for duct lengths varying from 5 to 70 ft. A curve was then drawn in which capacities were plotted against length of run. Similar curves for uninsulated ducts were also drawn, so that it was possible to superimpose the new curve on top of the old. For any given capacity being carried by the duct, it was found that a duct length on one curve corresponded to another length on the curve for the insulated duct. In other words, we had been able to establish the fact that the capacity at the end of say 20 feet on the uninsulated duct was the same as that at the end of say 29 feet of insulated duct. It was then a simple matter to make new headings such as are shown at the bottom of Tables 8 and 9.

It may be noted from a study of the headings for insulated and uninsulated ducts that:

a) In order for insulation to be fully effective it should be applied all the way from the bonnet to the boot fitting and not over just part of the run. The results would be better if the stacks could also be insulated.

b) Insulation is particularly effective for ducts that exceed about 15 to 20 feet. In the case of very long ducts, it is possible in many cases to use a smaller sized insulated duct and have a greater capacity than that for a larger duct which is not insulated.

If you have followed us up to this tedious point, which had to be somewhat technical in treatment, you will begin to appreciate that capacity Tables 8 and 9 given in Manual No. 7 were not derived overnight. There are some additional items, pickayunish ones, that we could elaborate upon, such as the checks we made to take into account the differences in air density on the warm and cold sides of the system. To do so would only lead to confusion. We do emphasize, however, that insofar as possible we have endeavored to obtain the best available data, and to rely upon existing standards and practices. The tables may be classified as short-cut tables, but they are not to be confused with so-called "rules of thumb" tables that are frequently picked out of a hat.

The question has been asked us whether the procedure cannot be simplied even further. It can be done, but the responsibility rests with the heating contractor. The main difficulty in the use of the capacity tables will be found in the step whereby you are required to add up the equivalent lengths of the fittings. This step can be greatly shortened if industry will make two additional moves towards simplification and standardization of practice:

a) The first obvious step is to reduce the number of types of fittings. Although we show typical boot fittings and have assigned a value for equivalent length to that fitting, we know from a study of catalogues that there are good as well as bad designs. We would like to lead industry away from bad designs that have high resistance. To that end we are willing to call a fittings manufacturers' clinic in Urbana at some future date to thrash out this problem. It is obvious that the fittings manufacturers who make prefabricated fittings will have to lead the way. We can only hope that the designs that they finally adopt will by common consent become the designs that will be used by those sheet metal workers who make their own fittings.

b) The second step that can be done in any design office is to make a simple diagram that shows all the fittings that are commonly used in a branch run. These would include a trunk takeoff fitting, a boot connection, a stackhead, and register. If such definite combinations were known it would be a simple matter to assign an equivalent length value for the combination. Then in any job, the chore of adding up the resistances of the fittings would be simplified. Our hope is that each contractor will do this step.

This article by Professor Konzo explaining how Tables 8 and 9 were calculated and set up will be particularly useful to students in the conferences to be conducted by G. A. Voorhees for the National Warm Air Heating & Air Conditioning Ass'n. An announcement of these schools is carried in this issue.

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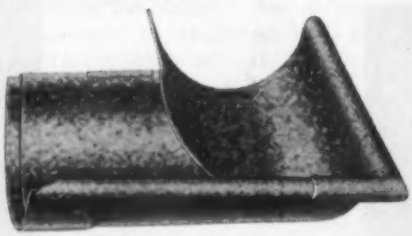

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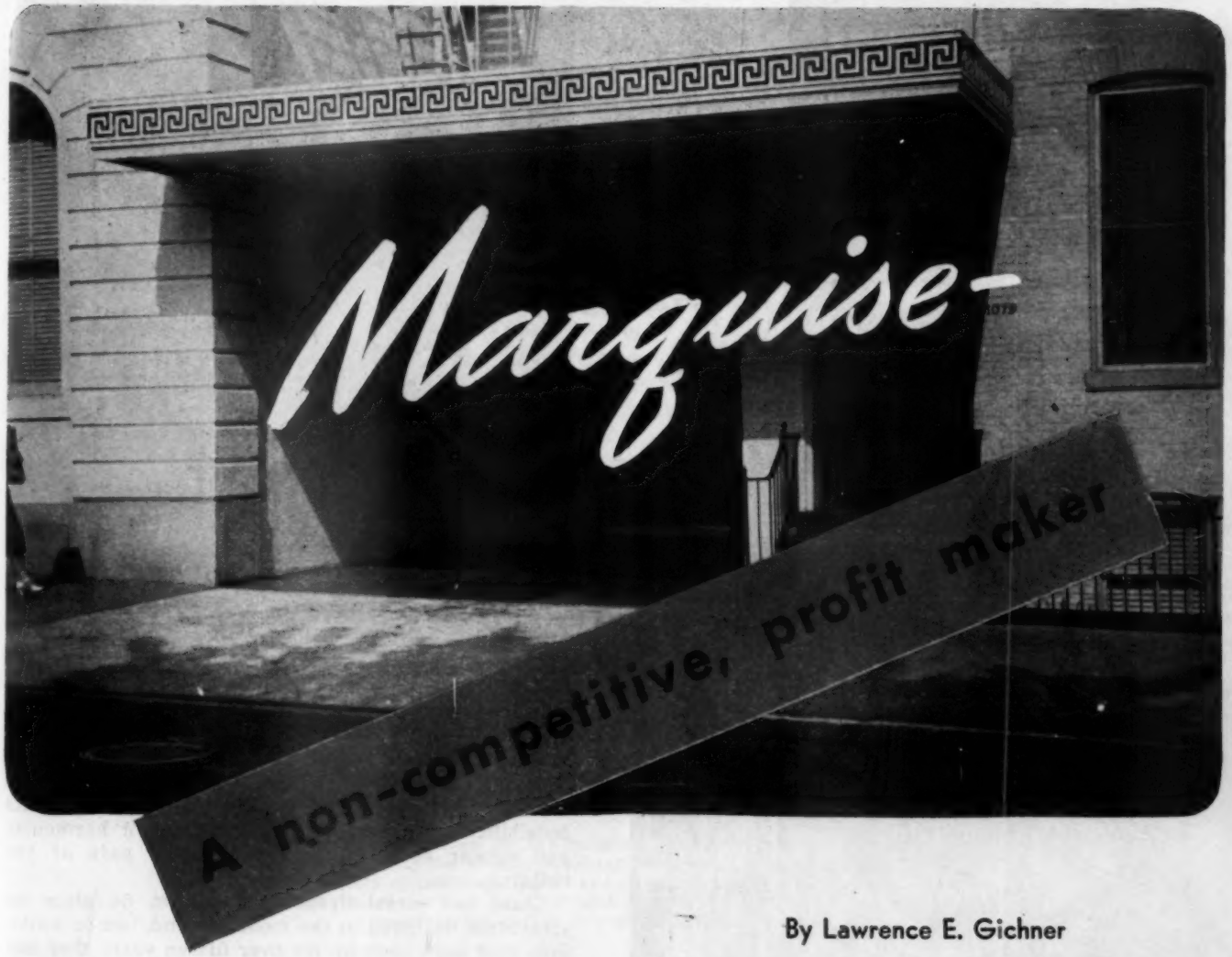


Marquise—A non-competitive, profit maker

By Lawrence E. Gichner

Gichner Sheet Metal Co., Washington, D. C.

WITH restrictions removed on most material and with construction once again permitted, the enterprising sheet metal contractor looking for non-competitive, long profit, ingenuity tickling work may do well to consider that old, old sheet metal specialty—the marquise.

There is even today nothing to equal a well built metal marquise to keep the sun out of one's eyes, and the rain off of one's head. For the business man with a store the marquise is an eye catching thing as it projects beyond the building line for additional advertising. For the apartment house owner the marquise gives his guests a chance to raise or lower their umbrellas; to stomp and shake to avoid tracking wet feet and dripping clothes into his building.

In most cases the marquise is an after consideration, not included in the original construction of the building. Because it is an added appendage, it offers the sheet metal contractor with ideas an opportunity to sell the purchasers an article on which he is his own specification writer. The contractor thereby eliminates considerable competition and is in a perfect position to sell direct to the owner. By raising himself to the position from sub-contractor to contractor he is in a better position to make a greater mark-up.

In doing one's own designing it is well to keep the spirit of the marquise in keeping with the building. An ultra modern design is entirely out of harmony on a residence built in 1880. Likewise the curls and twirls of fifty years ago have no place on a 1946 structure. Look your front over carefully and adapt its period and technique into your cornice facing, for after all it is the cornice that fundamentally makes one marquise different from another.

Some years back, Gichner, like others, built marquise in the orthodox fashion with glass tops. After the return of liquor hotel marquise particularly have suffered from the keen aim of well directed bottles out of guests' windows, and in several incidents even the guests themselves. In any number of cases we have permanently replaced glass with metal and, in trend with the times, we focus our attention on only solid roofs.

A solid top gives the opportunity to install indirect lighting or paneling underneath. An effective indirect light can be made very simply with a recessed metal box with a piece of frosted glass over the opening to conceal the glare of the bulbs. There are an endless number of ways in which Neon, and also Fluorescent lights can be worked into the design.

We consider one of our most successful jobs, from an appearance angle, a marquise on a funeral home

which had a stone Grecian border going around the building. We reproduced this Grecian border and made it the main motif of the cornice. Painted black and white it stands out like the proverbial "million dollars." Incidentally, proper color schemes can do much to highlight a marquise and make the most of its possibilities. Proper painting can make it harmonize and appear as an originally intended part of the building.

Glass and metal drops have almost no place on structures designed in the modern trend, but on buildings that have been up for over fifteen years they can be utilized to advantage.

Metal stamping companies offer one a grand variety of stock patterns to select from. Simple designs can be cut from the flat sheet. One of the photographs shows a drop made from 16 oz. copper and with glass drops.

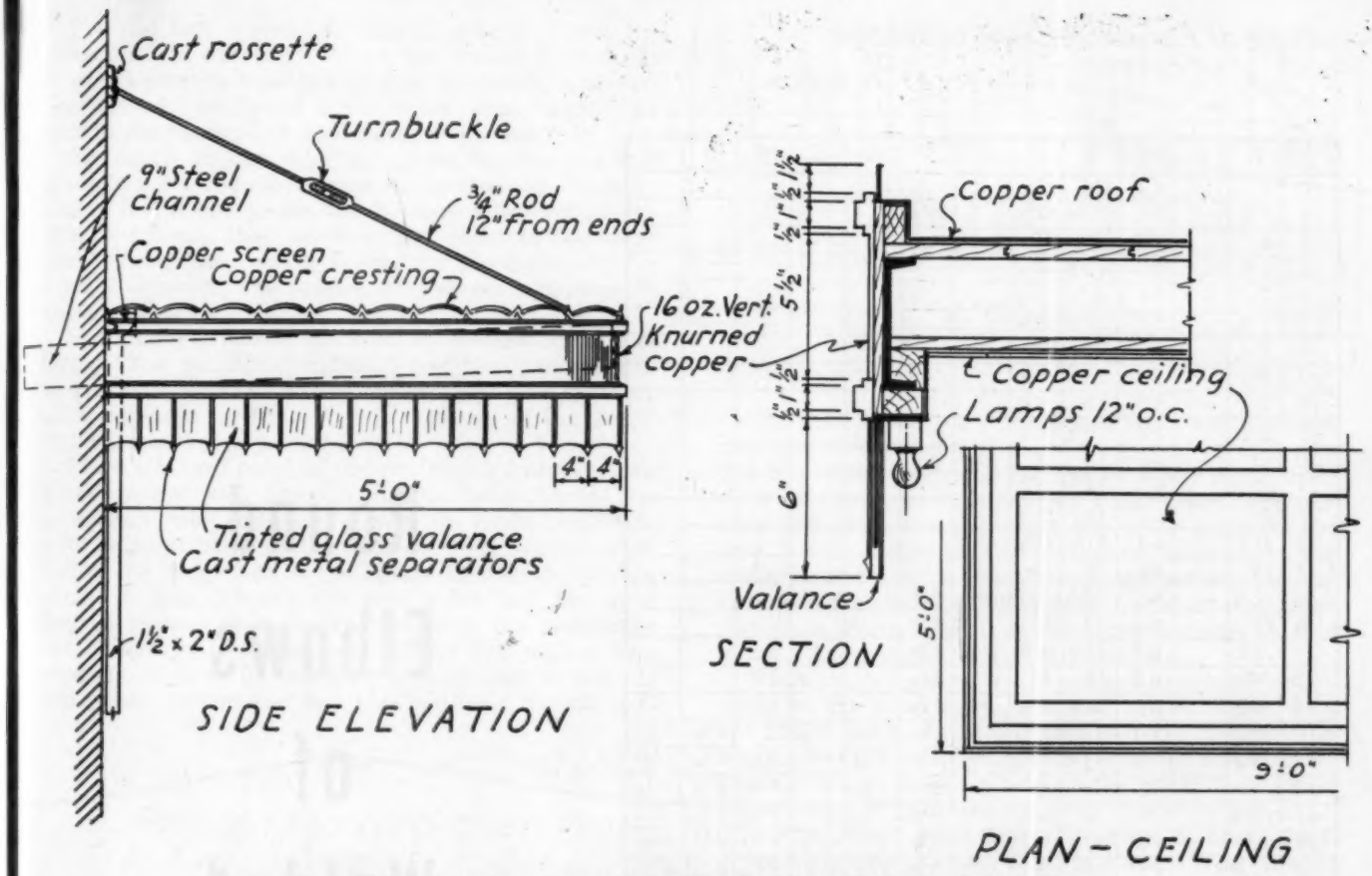
On an arched roof where standing seams are desired for appearance it is a quick method to install the sheets flat lock and then simply tack on with solder angle strips to simulate the raised seams.

Construction Details

Inside structural frame work we make either steel channels, wood, or both. The type of material used often depends upon requirements of the local building code. All chains and tie rods we have found advisable to anchor with heavy bolts through the supporting wall with a nut and thick washers on the inside. Sometimes this requires a small amount of plastering and papering on the inside, but to know that the marquise is securely erected during the winter's heaviest snows is certainly worth the small difference in expense and effort.

On marquise over 24 square feet in roof area some localities require a downspout. The tendency of many designers has been to use a 2-inch outlet. This size quickly becomes clogged, so we use nothing smaller than three inches.

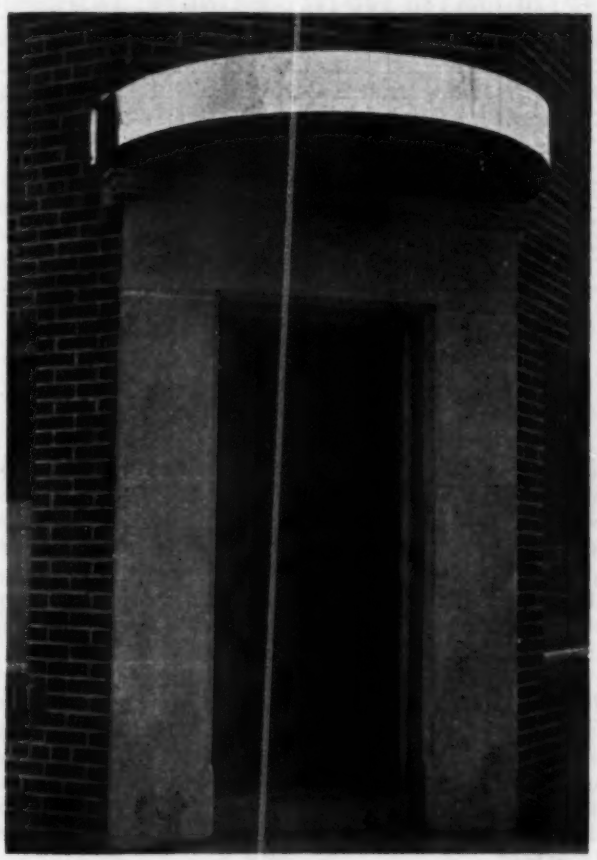
For an outlet to become clogged up on occasions is, of course, unavoidable. As a precautionary measure on flat marquise where the downspout is omitted we build an inch heighth standing seam around the outside of the roof above the cornice and one and a half



The photographs (taken by the author) show marquise Gichner Co. has designed and installed around Washington. The range in size and design and the variety of buildings "sold" are excellent proof of the author's statement that marquise can be a profitable activity. The plan above shows construction details common to most marquise.

inches back from the cornice face. At a strategic point, where overflowing water will do least harm, we either turn down the seam or install a small trough. When the janitor sees water coming out of this trough he recognizes the danger signal and knows it is time to clean the drain.

Marquise are not only fun to build, as each one is decidedly different, but they present an opportunity for additional source of revenue to one's business.



Round Elbows of Welded Construction

Part 3

By
J. P. Harner

Angle of Elbow in degrees				Number of Pieces in elbow								
	2	3		2	3	4	5	6	7	8	9	10
10	5		50	25	12½							
11	5½		51	25½	12¾							
12	6		52	26	13							
13	6½		53	26½	13¼							
14	7		54	27	13½							
15	7½		55	27½	13¾							
16	8		56	28	14							
17	8½		57	28½	14¼							
18	9		58	29	14½							
19	9½		59	29½	14¾							
20	10		60	30	15	10						
21	10½		61	30½	15¼	10⅙						
22	11		62	31	15½	10⅓						
23	11½		63	31½	15¾	10½						
24	12		64	32	16	10⅔						
25	12½		65	32½	16¼	10⅚	8⅛					
26	13		66	33	16½	11	8¼					
27	13½		67	33½	16¾	11⅙	8⅜					
28	14		68	34	17	11⅓	8½					
29	14½		69	34½	17¼	11½	8⅝					
30	15		70	35	17½	11⅔	8¾	7	5⅚	5	4⅜	3 15/18
31	15½		71	35½	17¾	11⅚	8⅞	7 1/10	5 11/12	5 1/14	4 7/16	3 9/9
32	16		72	36	18	12	9	7⅕	6	5⅐	4½	3 17/18
33	16½		73	36½	18¼	12⅙	9⅛	7 3/10	6 1/12	5 3/14	4 9/16	4
34	17		74	37	18½	12⅓	9¼	7 3/5	6⅙	5 3/7	4⅝	4 1/18
35	17½		75	37½	18¾	12½	9⅜	7½	6¼	5 5/14	4 11/16	4 1/9
36	18		76	38	19	12⅔	9½	7⅗	6⅓	5 3/7	4¾	4⅛
37	18½		77	38½	19¼	12⅚	9⅝	7 7/10	6 5/12	5 1/2	4 13/16	4 5/18
38	19		78	39	19½	13	9¾	7 4/5	6½	5 4/7	4⅞	4⅓
39	19½		79	39½	19¾	13⅙	9 7/8	7 9/10	6 7/12	5 9/14	4 15/16	4 5/18
40	20	10	80	40	20	13⅓	10	8	6⅔	5 5/7	5	4 4/9
41	20½	10¼	81	40½	20¼	13½	10⅛	8 1/10	6 9/12	5 7/14	5 1/16	4½
42	21	10½	82	41	20½	13 2/3	10¼	8⅕	6⅙	5 6/7	5⅛	4 5/9
43	21½	10¾	83	41½	20¾	13 5/6	10⅜	8 3/10	6 11/12	5 13/14	5 3/16	4 11/18
44	22	11	84	42	21	14	10½	8 2/5	7	6	5¼	4 2/3
45	22½	11¼	85	42½	21¼	14⅙	10 5/8	8½	7 1/12	6 1/14	5 5/16	4 13/18
46	23	11½	86	43	21½	14⅓	10¾	8⅗	7⅙	6 1/7	5⅜	4 7/9
47	23½	11¾	87	43½	21¾	14½	10⅞	8 3/10	7¼	6 3/14	5 7/16	4 15/18
48	24	12	88	44	22	14⅔	11	8⅘	7⅓	6 2/7	5½	4 8/9
49	24½	12¼	89	44½	22¼	14 5/6	11⅛	8 9/10	7 5/12	6 9/14	5 9/16	4 17/18
50	25	12½	90	45	22½	15	11¼	9	7½	6 3/7	5⅝	5

Chart No. 5

FOR the second detailed example, let us take a large elbow where the preliminary drawing cannot be made in the conventional manner. This elbow will be constructed from plate. It is doubtful if the average welder could handle the job, due to the equipment required. The example is given to show the range of the work possible with this method, and the operator should be in a position to handle any size elbows when the equipment is available.

Presume a 3-foot, 85-degree, 5-piece elbow with a 7-foot throat radius is made from ⅜ inch plate.

There are two practical methods of developing the preliminary drawing. First: The drawing is made on wrapping paper to a 3 inch scale using a triangular architect's scale rule. Second: The sketch can be drawn full size on the floor with chalk that may later be erased.

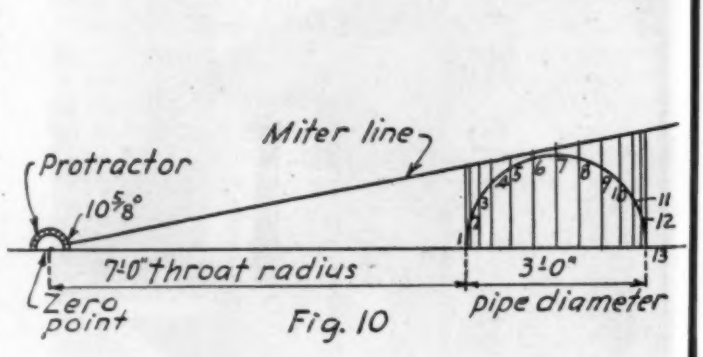


Fig. 10

For the first attempt in making a large elbow, the operator will naturally choose the second method, as it would seem to have less chance for errors, however, the first is preferred after some experience. The second method will be used here in this example.

The angle or degree of the miter line for the first piece in a 5-piece elbow must be determined. Turn to Chart No. 5 and locate the 85-degree bracket in the fourth column, then move to the right in the same plane under the column headed by the figure 5 (for 5 piece elbows). The bracket here shows 10⅝ degrees angle.

Snap a chalk line on the floor approximately 12 feet long (7 feet for throat radius, 3 feet for pipe diameter and a little extra). Establish near one end the zero point as shown in Fig. 10, then measure off the throat radius, then the pipe diameter.

Place the zero point of the protractor over the zero mark on the base line, keeping the base line of the protractor over and parallel with the chalk line. With a knife point mark on the floor the 10⅝ degree point. Using the long blade of the square as a straight edge, scribe a line through the zero point and the 10⅝ degree point. Recheck the line with the protractor for accuracy; if correct, extend the line with a long straight edge or by snapping a chalk line to a point somewhat beyond the last pipe outline. Extend ver-

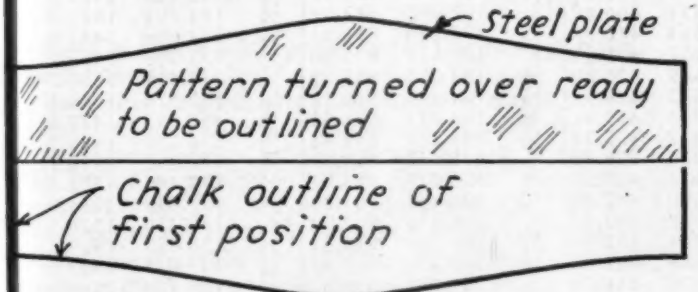


Fig. 12

tically each pipe outline until it intersects the miter line. On the base line locate the center point between the pipe outlines and extend vertically to the miter line.

In place of drawing the half profile above the miter line as explained in Fig. 6, it may be drawn as shown in Fig. 10 directly on the base line. Divide the half circle into any number of equal parts as shown. Through each of these points extend vertical lines connecting the base with the miter line. These are the true length lines used in developing the pattern.

Select a steel sheet ⅜ inch thick and on one edge starting at the left hand corner measure off the pipe circumference plus 3½ times the metal thickness if the pipe measurement is taken from the inside. This space represents the stretchout of the pipe. (Fig. 11.)

Locate the center point. Then divide each half into the same number of parts as the half circle shown in Fig. 10. Number the points. Through these points draw vertical lines with crayon, then transfer to these lines the height of the true length lines of similar number and as fully described under Fig. 7. Draw a curving line through these points with chalk forming the miter line, completing the pattern for the first piece. Now cut the pattern from the sheet. Remove any burrs or rough places on the miter edge, as this piece will now be used as a pattern.

Lay this piece on a metal sheet and mark carefully around its outline. Then cut out in the same manner. This gives the pattern for the last piece in the elbow.

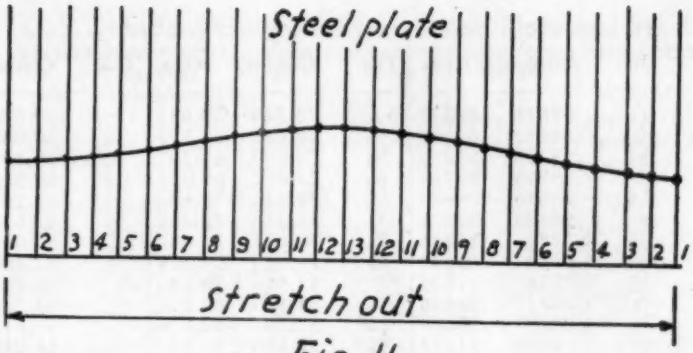


Fig. 11

The pattern for piece No. 2 and from which all the intermediate pieces are made is shown by Fig. 12. Select a steel sheet and lay the first end piece made on it as shown, mark around its outline carefully, now turn the piece over, keeping the lower edge on the line, mark around the ends and miter, remove the pattern. The outline just made is the pattern for *any* intermediate piece. Cut this from the sheet and make two more pieces like it, as there are 5 pieces in this elbow (2 end pieces and 3 intermediate).

When all pieces are cut out and any noticeable rough spots on the miter edges removed, roll to shape, weld the throat seams together, then test for accuracy by placing the mitered end on some level flat surfaces. If there are any uneven places in the miter that would interfere with the welding, they should be cut off.

A stay is then made from this metal or heavy cardboard as described under Figures 8 and 9. The mitered ends of pieces No. 1 and 2 are now fitted together and checked with the stay. The pieces should now be beveled if necessary, then carefully tacked together. The elbow is now checked for angle, and if correct, welded.

The manner of beveling the edges and welding are not discussed here as it is presumed the operator understands this part of his trade.

These examples describe the construction of a simple 3-piece, 14-gauge elbow and a 5-piece plate elbow.

DECIMALS OF AN INCH FOR EACH 1-64th

32nds	64ths	Decimal	Fraction	32nds	64ths	Decimal	Fraction
	1	.015625			33	.515625	
1	2	.03125		17	34	.53125	
	3	.046875			35	.546875	
2	4	.0625	1/16	18	36	.5625	9/16
	5	.078125			37	.578125	
3	6	.09375		19	38	.59375	
	7	.109375			39	.609375	
4	8	.125	1/8	20	40	.625	5/8
	9	.140625			41	.640625	
5	10	.15625		21	42	.65625	
	11	.171875			43	.671875	
6	12	.1875	3/16	22	44	.6875	11/16
	13	.203125			45	.703125	
7	14	.21875		23	46	.71875	
	15	.234375			47	.734375	
8	16	.25	1/4	24	48	.75	3/4
	17	.265625			49	.765625	
9	18	.28125		25	50	.78125	
	19	.296875			51	.796875	
10	20	.3125	5/16	26	52	.8125	13/16
	21	.328125			53	.828125	
11	22	.34375		27	54	.84375	
	23	.359375			55	.859375	
12	24	.375	3/8	28	56	.875	7/8
	25	.390625			57	.890625	
13	26	.40625		29	58	.90625	
	27	.421875			59	.921875	
14	28	.4375	7/16	30	60	.9375	15/16
	29	.453125			61	.953125	
15	30	.46875		31	62	.96875	
	31	.484375			63	.984375	
16	32	.5	1/2	32	64	1.	1

Fig. 15

Dia.	Circum.	Area	Dia.	Circum.	Area	Dia.	Circum.	Area	Dia.	Circum.	Area	Dia.	Circum.	Area
1/32	.09818	.00077	9	28.274	63.617	19	59.690	283.53	29	91.106	660.52	39	122.522	1194.6
1/16	.19635	.00307	1/8	28.667	65.397	1/8	60.083	287.27	1/8	91.499	666.23	1/8	122.915	1202.3
1/8	.39270	.01227	1/4	29.060	67.201	1/4	60.476	291.04	1/4	91.892	671.96	1/4	123.308	1210.0
3/16	.58905	.02761	3/8	29.452	69.029	3/8	60.868	294.83	3/8	92.284	677.71	3/8	123.700	1217.7
1/4	.78540	.04909	1/2	29.845	70.882	1/2	61.261	298.65	1/2	92.677	683.49	1/2	124.093	1225.4
5/16	.98175	.07670	5/8	30.238	72.760	5/8	61.654	302.49	5/8	93.070	689.30	5/8	124.486	1233.2
3/8	1.1781	.11045	3/4	30.631	74.662	3/4	62.046	306.35	3/4	93.462	695.13	3/4	124.878	1241.0
7/16	1.3744	.15033	7/8	31.023	76.589	7/8	62.439	310.24	7/8	93.855	700.98	7/8	125.271	1248.8
1/2	1.5708	.19635	10	31.416	78.540	20	62.832	314.16	30	94.248	706.86	40	125.664	1256.6
9/16	1.7671	.24850	1/8	31.809	80.516	1/8	63.225	318.10	1/8	94.640	712.76	1/8	126.056	1264.5
5/8	1.9635	.30680	1/4	32.201	82.516	1/4	63.617	322.06	1/4	95.033	718.69	1/4	126.449	1272.4
11/16	2.1598	.37122	3/8	32.594	84.541	3/8	64.010	326.05	3/8	95.426	724.64	3/8	126.842	1280.3
3/4	2.3562	.44179	1/2	32.987	86.590	1/2	64.403	330.06	1/2	95.819	730.62	1/2	127.235	1288.2
13/16	2.5525	.51849	5/8	33.379	88.664	5/8	64.795	334.10	5/8	96.211	736.62	5/8	127.627	1296.2
7/8	2.7489	.60132	3/4	33.772	90.763	3/4	65.188	338.16	3/4	96.604	742.64	3/4	128.020	1304.2
15/16	2.9452	.69029	7/8	34.165	92.886	7/8	65.581	342.25	7/8	96.997	748.69	7/8	128.413	1312.2
1	3.1416	.7854	11	34.558	95.033	21	65.973	346.36	31	97.389	754.77	41	128.805	1320.3
1/8	3.5343	.9940	1/8	34.950	97.205	1/8	66.366	350.50	1/8	97.782	760.87	1/8	129.198	1328.3
1/4	3.9270	1.2272	1/4	35.343	99.402	1/4	66.759	354.66	1/4	98.175	766.99	1/4	129.591	1336.4
3/8	4.3197	1.4849	3/8	35.736	101.62	3/8	67.152	358.84	3/8	98.567	773.14	3/8	129.983	1344.5
1/2	4.7124	1.7671	1/2	36.128	103.87	1/2	67.544	363.05	1/2	98.960	779.31	1/2	130.376	1352.7
5/8	5.1051	2.0739	5/8	36.521	106.14	5/8	67.937	367.28	5/8	99.353	785.51	5/8	130.769	1360.8
3/4	5.4978	2.4053	3/4	36.914	108.43	3/4	68.330	371.54	3/4	99.746	791.73	3/4	131.161	1369.0
7/8	5.8905	2.7612	7/8	37.306	110.75	7/8	68.722	375.83	7/8	100.138	797.98	7/8	131.554	1377.2
2	6.2832	3.1416	12	37.699	113.10	22	69.115	380.13	32	100.531	804.25	42	131.947	1385.4
1/8	6.6759	3.5466	1/8	38.092	115.47	1/8	69.508	384.46	1/8	100.924	810.54	1/8	132.340	1393.7
1/4	7.0686	3.9761	1/4	38.485	117.86	1/4	69.900	388.82	1/4	101.316	816.86	1/4	132.732	1402.0
3/8	7.4613	4.4301	3/8	38.877	120.28	3/8	70.293	393.20	3/8	101.709	823.21	3/8	133.125	1410.3
1/2	7.8540	4.9087	1/2	39.270	122.72	1/2	70.686	397.61	1/2	102.102	829.58	1/2	133.518	1418.6
5/8	8.2467	5.4119	5/8	39.663	125.19	5/8	71.079	402.04	5/8	102.494	835.97	5/8	133.910	1427.0
3/4	8.6394	5.9396	3/4	40.055	127.68	3/4	71.471	406.49	3/4	102.887	842.39	3/4	134.303	1435.4
7/8	9.0321	6.4918	7/8	40.448	130.19	7/8	71.864	410.97	7/8	103.280	848.83	7/8	134.696	1443.8
3	9.4248	7.0686	13	40.841	132.73	23	72.257	415.48	33	103.673	855.30	43	135.088	1452.2
1/8	9.8175	7.6699	1/8	41.233	135.30	1/8	72.649	420.00	1/8	104.065	861.79	1/8	135.481	1460.7
1/4	10.210	8.2958	1/4	41.626	137.89	1/4	73.042	424.56	1/4	104.458	868.31	1/4	135.874	1469.1
3/8	10.603	8.9462	3/8	42.019	140.50	3/8	73.435	429.13	3/8	104.851	874.85	3/8	136.267	1477.6
1/2	10.996	9.6211	1/2	42.412	143.14	1/2	73.827	433.74	1/2	105.243	881.41	1/2	136.659	1486.2
5/8	11.388	10.321	5/8	42.804	145.80	5/8	74.220	438.36	5/8	105.636	888.00	5/8	137.052	1494.7
3/4	11.781	11.045	3/4	43.197	148.49	3/4	74.613	443.01	3/4	106.029	894.62	3/4	137.445	1503.3
7/8	12.174	11.793	7/8	43.590	151.20	7/8	75.006	447.69	7/8	106.421	901.26	7/8	137.837	1511.9
4	12.566	12.566	14	43.982	153.94	24	75.398	452.39	34	106.814	907.92	44	138.230	1520.5
1/8	12.959	13.364	1/8	44.375	156.70	1/8	75.791	457.11	1/8	107.207	914.61	1/8	138.623	1529.2
1/4	13.352	14.186	1/4	44.768	159.48	1/4	76.184	461.86	1/4	107.600	921.32	1/4	139.015	1537.9
3/8	13.744	15.033	3/8	45.160	162.30	3/8	76.576	466.64	3/8	107.992	928.06	3/8	139.408	1546.6
1/2	14.137	15.904	1/2	45.553	165.13	1/2	76.969	471.44	1/2	108.385	934.82	1/2	139.801	1555.3
5/8	14.530	16.800	5/8	45.946	167.99	5/8	77.362	476.26	5/8	108.778	941.61	5/8	140.194	1564.0
3/4	14.923	17.721	3/4	46.338	170.87	3/4	77.754	481.11	3/4	109.170	948.42	3/4	140.586	1572.8
7/8	15.315	18.665	7/8	46.731	173.78	7/8	78.147	485.98	7/8	109.563	955.25	7/8	140.979	1581.6
5	15.708	19.635	15	47.124	176.71	25	78.540	490.87	35	109.956	962.11	45	141.372	1590.4
1/8	16.101	20.629	1/8	47.517	179.67	1/8	78.933	495.79	1/8	110.348	969.00	1/8	141.764	1599.3
1/4	16.493	21.648	1/4	47.909	182.65	1/4	79.325	500.74	1/4	110.741	975.91	1/4	142.157	1608.2
3/8	16.886	22.691	3/8	48.302	185.66	3/8	79.718	505.71	3/8	111.134	982.84	3/8	142.550	1617.0
1/2	17.279	23.758	1/2	48.695	188.69	1/2	80.111	510.71	1/2	111.527	989.80	1/2	142.942	1626.0
5/8	17.671	24.850	5/8	49.087	191.75	5/8	80.503	515.72	5/8	111.919	996.78	5/8	143.335	1634.9
3/4	18.064	25.967	3/4	49.480	194.83	3/4	80.896	520.77	3/4	112.312	1003.8	3/4	143.728	1643.9
7/8	18.457	27.109	7/8	49.873	197.93	7/8	81.289	525.84	7/8	112.705	1010.8	7/8	144.121	1652.9
6	18.850	28.274	16	50.265	201.06	26	81.681	530.93	36	113.097	1017.9	46	144.513	1661.9
1/8	19.242	29.465	1/8	50.658	204.22	1/8	82.074	536.05	1/8	113.490	1025.0	1/8	144.906	1670.9
1/4	19.635	30.680	1/4	51.051	207.39	1/4	82.467	541.19	1/4	113.883	1032.1	1/4	145.299	1680.0
3/8	20.028	31.919	3/8	51.444	210.60	3/8	82.860	546.35	3/8	114.275	1039.2	3/8	145.691	1689.1
1/2	20.420	33.183	1/2	51.836	213.82	1/2	83.252	551.55	1/2	114.668	1046.3	1/2	146.084	1698.2
5/8	20.813	34.472	5/8	52.229	217.08	5/8	83.645	556.76	5/8	115.061	1053.5	5/8	146.477	1707.4
3/4	21.206	35.785	3/4	52.622	220.35	3/4	84.038	562.00	3/4	115.454	1060.7	3/4	146.869	1716.5
7/8	21.598	37.122	7/8	53.014	223.65	7/8	84.430	567.27	7/8	115.846	1068.0	7/8	147.262	1725.7
7	21.991	38.485	17	53.407	226.98	27	84.823	572.56	37	116.239	1075.2	47	147.655	1734.9
1/8	22.384	39.871	1/8	53.800	230.33	1/8	85.216	577.87	1/8	116.632	1082.5	1/8	148.048	1744.2
1/4	22.776	41.282	1/4	54.192	233.71	1/4	85.608	583.21	1/4	117.024	1089.8	1/4	148.440	1753.5
3/8	23.169	42.718	3/8	54.585	237.10	3/8	86.001	588.57	3/8	117.417	1097.1	3/8	148.833	1762.7
1/2	23.562	44.179	1/2	54.978	240.53	1/2	86.394	593.96	1/2	117.810	1104.5	1/2	149.226	1772.1
5/8	23.955	45.664	5/8	55.371	243.98	5/8	86.786	599.37	5/8	118.202	1111.8	5/8	149.618	1781.4
3/4	24.347	47.173	3/4	55.763	247.45	3/4	87.179	604.81	3/4	118.596	1119.2	3/4	150.011	1790.8
7/8	24.740	48.707	7/8	56.156	250.95	7/8	87.572	610.27	7/8	118.988	1126.7	7/8	150.404	1800.1
8	25.133	50.265	18	56.549	254.47	28	87.965	615.75	38	119.381	1134.1	48	150.796	1809.6
1/8	25.525	51.849	1/8	56.941	258.02	1/8	88.357	621.26	1/8	119.773	1141.6	1/8	151.189	1819.0
1/4	25.918	53.456	1/4	57.334	261.59	1/4	88.750	626.80	1/4	120.166	1149.1	1/4	151.582	1828.5
3/8	26.311	55.088	3/8	57.727	265.18	3/8	89.143	632.36	3/8	120.559	1156.6	3/8	151.975	1837.9
1/2	26.704	56.745	1/2	58.119	268.80	1/2	89.535	637.94	1/2	120.951	1164.2	1/2	152.367	1847.5
5/8	27.096	58.426	5/8	58.512	272.45	5/8	89.928	643.55	5/8	121.344	1171.7	5/8	152.760	1857.0
3/4	27.489	60.132	3/4	58.905	276.12	3/4	90.321	649.18	3/4	121.737	1179.3	3/4	153.153	1866.5
7/8	27.882	61.862	7/8	59.298	279.81	7/8	90.713	654.84	7/8	122.129	1186.9	7/8	153.545	1876.1

Fig. 13

The reader should have no difficulty in laying out any other size or angle.

To gain skill and confidence in laying out elbow patterns the beginner should lay out patterns on paper of, say, 4 inches in diameter and different angles and throat radius and number of pieces. Cut out the patterns and fit them together, make a stay and check the angles. With such practice the beginner will soon find there is no round elbow that cannot be easily and quickly laid out.

Elbows Over 90-Degrees

Chart 5 gives the angle for the miter line for all round elbows up to and including 90 degrees. Elbows of more than 90 degrees are seldom used; however, in some installations they are necessary. The operator can easily determine the angle of the miter line for these as follows:

Example: A 5-piece, 140 degree elbow is required. In this elbow there are two end pieces and three intermediate pieces. Count each end piece as 1 and each intermediate piece as 2.

Thus: Two end pieces ..... = 2
Three intermediate pieces... = 3
3 × 2 ..... = 6
6 + 2 ..... = 8
140 ÷ 8 ..... = 17½

So 17½ degree angle is the miter line in laying out the first section.

The miter line for any other angle is found in the same manner. Chart 5 is based on this principle.

For convenience a circumference table is shown as Fig. 13. Also a table of U. S. Standard gauges for iron and steel, Fig. 14. And a decimal table, Fig. 15. These tables will be found valuable for quick reference.

The above method of elbow layout is not a "new or trick method." It is based on standard pattern development, revised, with all nonessential parts omitted. The author has used it for years on many different sizes and angles of elbows.

The author is completing an angle Calculator of the slide type that will show the angle of the miter line in inches and fractions in place of degrees as shown by Chart No. 5 for any round elbow from 10 to 90-degrees.

This will further facilitate the layout for the miter line as a mechanic's rule showing 1 inch graduated into 32nds and 64ths is used in place of the protractor for this part of the work.

U. S. Standard Gauge for Iron Sheet, Plate and Steel.

No. of Gage	Approx. Thickness in fractions	U. S. Thickness in decimals	Steel Approx. thickness (decimals)	Weight per sq. ft. (ounces)	Weight per sq. ft. (pounds)
7-0	1-2	0.5	0.5	320	20.
6-0	15-32	0.4688	0.460	300	18.75
5-0	7-16	0.4375	0.429	280	17.5
4-0	13-32	0.4062	0.398	260	16.25
3-0	3-8	0.375	0.368	240	15.
2-0	11-32	0.3438	0.337	220	13.75
0	5-16	0.3125	0.306	200	12.5
1	9-32	0.2813	0.2757	180	11.25
2	17-64	0.2656	0.2604	170	10.625
3	1-4	0.25	0.2451	160	10.
4	15-64	0.2344	0.2298	150	9.375
5	7-32	0.2188	0.2145	140	8.75
6	13-64	0.2031	0.1991	130	8.125
7	3-16	0.1875	0.1838	120	7.5
8	11-64	0.1719	0.1685	110	6.875
9	5-32	0.1563	0.1532	100	6.25
10	9-64	0.1406	0.1379	90	5.625
11	1-8	0.125	0.1225	80	5.
12	7-64	0.1094	0.1072	70	4.375
13	3-32	0.0938	0.0919	60	3.75
14	5-64	0.0781	0.0766	50	3.125
15	9-128	0.0703	0.0689	45	2.8125
16	1-16	0.0625	0.0613	40	2.5
17	9-160	0.0563	0.0551	36	2.25
18	1-20	0.05	0.0490	32	2.
19	7-160	0.0438	0.0429	28	1.75
20	3-80	0.0375	0.0368	24	1.5
21	11-320	0.0344	0.0337	22	1.375
22	1-32	0.0313	0.0306	20	1.25
23	9-320	0.0281	0.0276	18	1.125
24	1-40	0.025	0.0245	16	1.
25	7-320	0.0219	0.0214	14	0.875
26	3-160	0. 0188	0.0184	12	0.75
27	11-640	0.0172	0.0169	11	0.6975
28	1-64	0.0156	0.0153	10	0.625
29	9-640	0.0141	0.0138	9	0.5625
30	1-80	0.0125	0.0123	8	0.5
31	7-640	0.0109	0.0107	7	0.4375
32	13-1280	0.0102	0.0100	6½	0.40625
33	3-320	0.0094	0.0092	6	0.375
34	11-1280	0.0086	0.0084	5½	0.34375
35	5-640	0.0078	0.0077	5	0.375
36	9-1280	0.0070	0.0067	4½	0.28125
37	17-2560	0.0066	0.0065	4¼	0.265625
38	1-160	0.0063	0.0061	4	0.25
39	3-512	0.0059	0.0057	3¾	0.234375
40	7-1280	0.0055	0.0054	3½	0.21875

Fig. 14

Kruckman—Washington Is Drowning in VHP-No. 1

(*Continued from page* 49)

short supply of galvanized. There is not enough galvanized and there will not be enough galvanized, no matter what is done. The thing that I think we can do and must do is to see to it that the thin supply is spread equitably to keep the maximum number of companies going as best we can.

CPA Helplessness

In this hearing the Captain emphasized his faith in "voluntary preferential ratings" administered by the steel companies. He apparently still finds no better way to help the essential "warm air heating industry," which he has now declared produces one of the critical needs for housing. In this hearing, Max L. Rysdon, President, Sioux Steel Co., Sioux Falls, South Dakota, pointed out that one steel mill sold its entire galvanized sheet production through its own fabrication subsidiaries at $250 to $285 a ton in direct contrast to the possible sale of the sheet to independent fabricators of galvanized sheets at $74 a ton.

Mr. Warren Huff, the Price Executive for Steel in OPA comforted Mr. Rysdon by the suggestion that it is elemental economics for the integrated steel companies to use their galvanized sheets to make the profit there may be between a $74 per ton sale to Mr. Rysdon, and the $250 per ton yield that is produced by means of their own subsidiaries. He emphasized there is nothing OPA can do about it. Huff suggested Mr. Rysdon might buy steel from the warehouses.

Another witness, M. T. Bentzen, President, Gen-

(*Continued on page* 126)

Pattern Development for

Heavy Gauge Blow Pipe Fittings*

[Dust Conveying Floor Sweep]

By William Neubecker

THIS sixth article will cover the pattern development for a dust conveying "up floor sweep" with hinged flap door as shown in the perspective view marked B, which was reproduced from the book Standard Practice in Sheet Metal Work on Plate No. 31, page 547. Up or down floor sweeps of this type are usually constructed from No. 20-gauge galvanized sheet iron.

If riveted construction is employed, all laps should be placed on the outside, riveted, and soldered as shown in the perspective view B, so as to provide a smooth internal surface.

The problem presents a rectangular curved elbow transforming to a round pipe connection and is developed as shown on the full page details covering Figs. 23 to 27 inclusive in the accompanying illustrations. As No. 20 gauge galvanized sheet iron is 3/80 or practically 1/27 inch in thickness, no neutral dimensions need be employed in developing the various pattern shapes. Assuming that a six-inch diameter pipe is used, the size of the rectangular inlet need not be much in excess to the area of the round pipe. In other words, the area of the 6-inch pipe would be 6×6× .7854 or 28.27 sq. inches. If the rectangular inlet is made 3.5×9.5 the area would be 33.25 sq. inches or about 5 sq. inches in excess.

Knowing the diameter of the round pipe and the dimensions of the rectangular inlet, the side elevation of the elbow is first drawn as shown in the side elevation in Fig. 23 by *6-14-19-13-6*, using *E* as the center for describing the heel *6-13* and *F* the center for describing the throat *14-18*, making the distance *6-14* equal to diameter of the pipe or 6 inches. Above the line *6-14* draw the side elevation of the transition piece rectangular to round as shown by *C-D-14-6*.

In its proper position below the side elevation draw the plan view as shown, making the distance *A-A* equal to the inlet, in this case 9.5 inches. In practice it is only necessary to draw the one-half plan. To the right of the side elevation draw the front elevation as shown, which indicates the size of the rectangular intake. Often a slot is cut in the heel at *e-f* in side elevation, to give a continuous suction, which also permits nails, rivets washers, etc., to drop out before being drawn into the piping. Having drawn the two elevations and plan in their proper relative positions, the pattern shapes are now in order.

True Lengths for Transition

Space the one quarter circle in place as shown by the small figures *1* to *5*, from which points, draw lines to the corner *A*. Now take the various distances *A* to *1*. *2*. *3* *4* and *5* and set them off on the horizontal line shown in Fig. 24, measuring in each instance from *A°* as shown by similar numbered points *1* to *5* inclusive. At right angles to *A°-1*, from *A°*, draw the line *A°-A* equal to the height of the transition as shown, and draw lines from points *1* to *5* to the apex *A*, which will be the true lengths of similar numbered lines in the plan in Fig. 23.

Patterns for the Heel and Throat

Make the distance from *6* to *6°* in the heel pattern in Fig. 25 equal to *A-A* in plan in Fig. 23. Now with radii equal to *A-1*, *A-2* and *A-3* in the true lengths in Fig. 24 and using points *6* and *6°* in Fig. 25 as centers, describe short arcs, indicated by similar numbers. Set the dividers equal to divisions between points *1* and *3* in plan in Fig. 23 and starting from the intersecting arcs at *1* in Fig. 25 step to arcs *2* and *3* on both sides as shown by the heavy dots. Trace a line through points so obtained from *3* to *1* to *3* and draw lines to the apexes at *6* and *6°*. Now space the heel in side elevation in Fig. 23 as shown by the numbers *6* to *13* including the hem edge *b* and place these divisions on the horizontal line drawn from the lower point *6* in the heel pattern in Fig. 25 as indicated by similar numbers and the letter *b*. From this point *b* draw a perpendicular line to meet the upper horizontal line drawn from *6°*, at *b°*. Then will the outline *b-6-3-3-6°-b°* be the net pattern for the heel of the elbow including the partial transition combined.

As the slot in the heel in Fig. 23 comes between points *9* and *10*, as indicated by *e-f*, take this distance and set it off between *9* and *10* in the pattern in Fig. 25 and indicate the slot cut as shown by the dotted outline in the heel pattern. Now space the throat of the elbow in Fig. 23 in equal divisions as shown from *14* to *19* including the hem edge *a* and set off these divisions in Fig. 25 (over the heel pattern) as shown from *14* to *19* to *a*. Through *a* draw a perpendicular line representing the lower end of the throat pattern. Then will that portion from the arrow point *X* to the top of the transition *3-3* be the desired net throat pattern.

Pattern Shape for Sides

In Fig. 26 is shown the pattern for the sides of the transition "sweep." It has been placed in a reversed position for want of space and is developed as follows: Take a reproduction of *6-14-19-13-6* in the side elevation in Fig. 23 and place it in a reversed position as shown by similar numbers in Fig. 26. Now with radii equal to *A-3*, *A-4* and *A-5* in the true lengths in Fig.

(*Text continued on page* 139)

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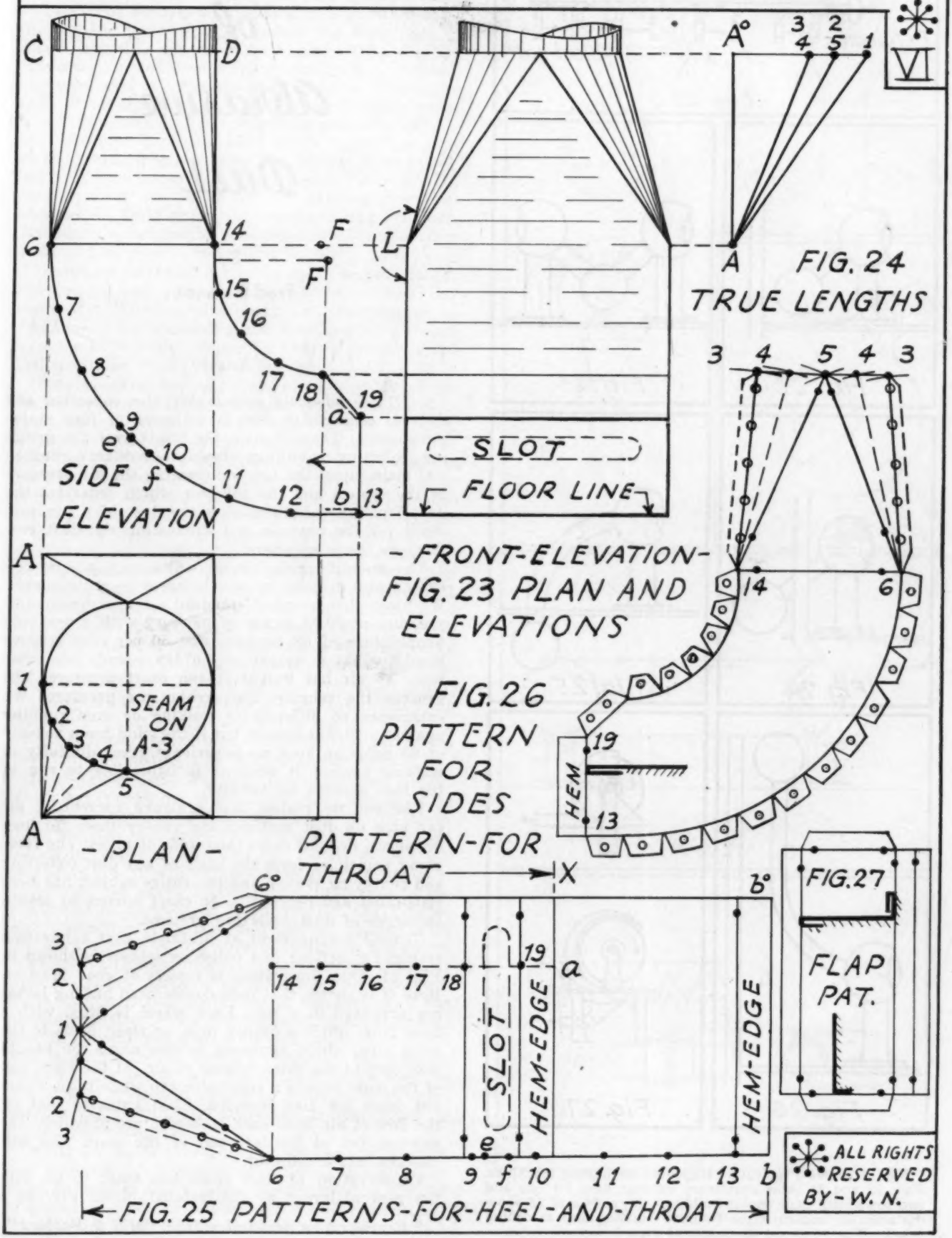
PATTERNS FOR DUST CONVEYING-UP FLOOR SWEEP-WITH FLAP DOOR AND ROUND CONNECTION



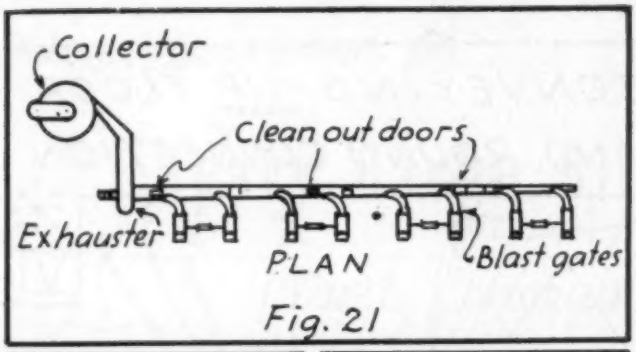


Fig. 21

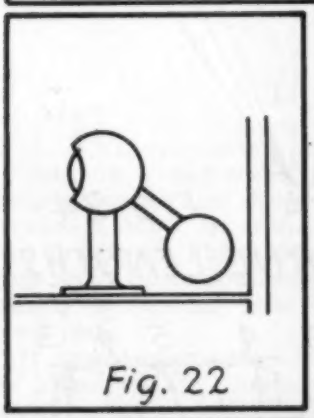


Fig. 22

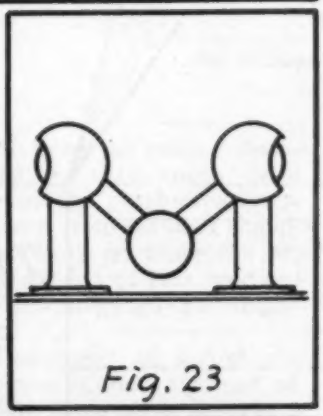


Fig. 23

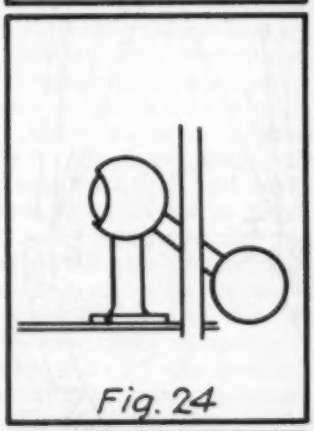


Fig. 24

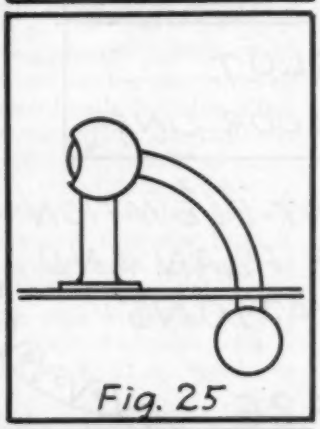


Fig. 25

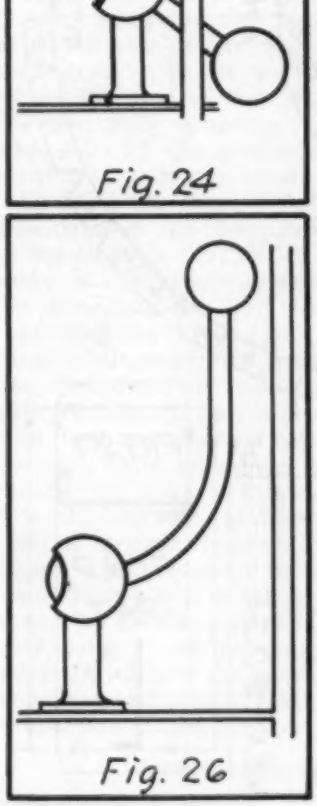


Fig. 26

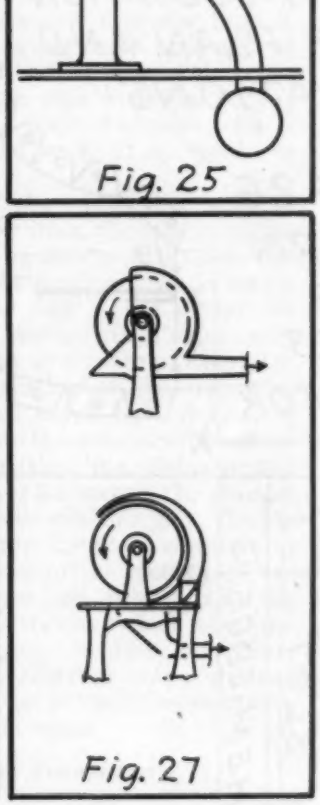


Fig. 27

Fig. 21 shows a typical arrangement for buffing machines. Figs. 22 and 23 show customary exhaust lines for one and two rows with main inside building. Figs. 24 and 25 show the main in unused space (outside building and at ceiling below. Fig. 26 shows an overhead main in unused space.

Control of Abrasive Dust *

By

Fred B. Jacobs

AN adequate system for the collection and disposal of abrasive dust is composed of four major components. These include the hoods over the grinding, polishing or buffing wheels, the system of branch and main pipes, the fan for creating the air pressure in the system and the collector which separates the dust from the air, disposing the dust in a bin provided for the purpose and exhausting the dust free air into the atmosphere.

The scientific principle on which such a dust collecting and disposal system is based is quite simple. We know that so-called standard air at a barometric pressure of 29.92 inches of mercury with a dry bulb temperature of 68 degrees, and 50 per cent relative humidity has a weight of 0.07488 pounds per cubic foot. As air has weight it can exert pressure. The greater the velocity, the greater the pressure. We experience no difficulty in walking or even running against a 10 mile breeze, but if the wind has a velocity of 60 miles an hour we experience great difficulty in walking against it while it is impossible to run in the face of such air velocity.

Further, we realize that a strong current of air can pick up dust particles and convey them for long distances, in some cases thousands of miles. The foregoing principles form the basis of any dust collecting and conveying system and the entire subject has been elaborated and reduced to an exact science by manufacturers of dust collecting systems.

General arrangement of a simple dust exhausting system for buffing and polishing wheels is shown in Fig. 21. This illustration is typical of good practice. Here it is shown that four double head buffing lathes are arranged in a row. Each wheel is fitted with a hood from which a branch pipe, or riser, leads to the main pipe, which increases in size along the line to take care of the extra volume of air. At the right end of the main pipe is a removable cap while three cleanout doors are also provided. Blast gates to shut off the flow of air from each hood also are provided. The exhaust fan at the left end of the main pipe discharges into a collector.

Conservation of floor space has much to do with the general layout of the installation. In Fig. 22 a

* *Reprinted by permission from "Mill & Factory."*

row of lathes is arranged near the wall of the building so as to get the advantage of daylight. The main pipe runs back of the lathes next to the wall. In Fig. 23 is shown an arrangement whereby one main pipe serves two rows of lathes which are installed back to back. The arrangement shown in Fig. 24 is novel in that the main pipe is outside the wall (out of doors) and thus conserves floor space. Why this arrangement is not used more generally is a question of conjecture. It certainly does conserve floor space as it places the main pipe in a location where space is not generally used for other purposes. In Fig. 25 the main pipe is placed below the floor, while in Fig. 26 the main pipe runs along the ceiling. Each installation has its advantages and disadvantages. Thus a careful survey should be made of existing surroundings before deciding on the merits of any one plan. State laws also must be considered as they often are quite arbitrary as to the piping details.

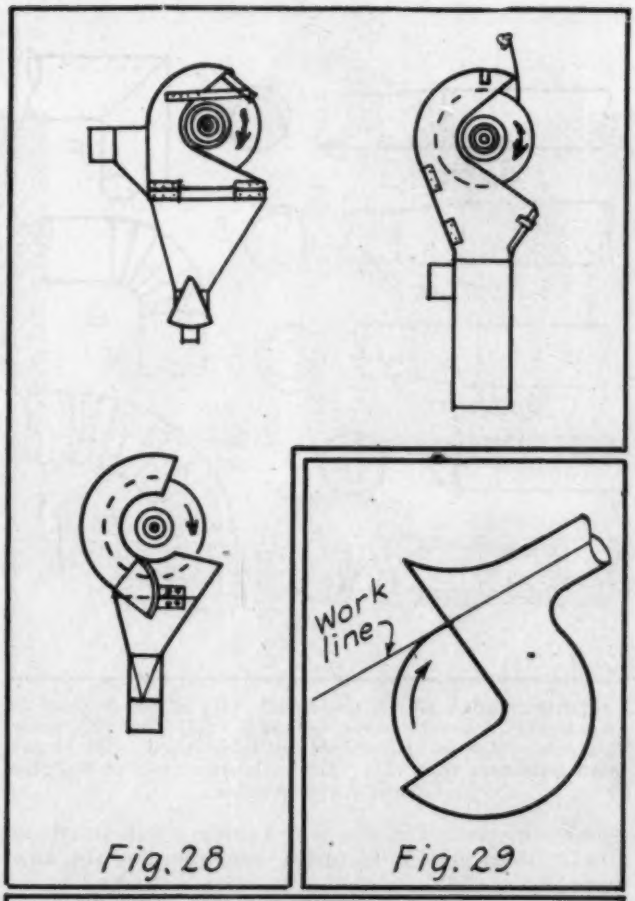
Design of the wheel hoods has much to do with the efficiency of any abrasive dust removal system. According to Winslow, Greenburg and Angermeyer in "Standards for Measuring the Efficiency of Exhaust Systems in Polishing Shops," a bulletin issued by the United States Public Health Service:

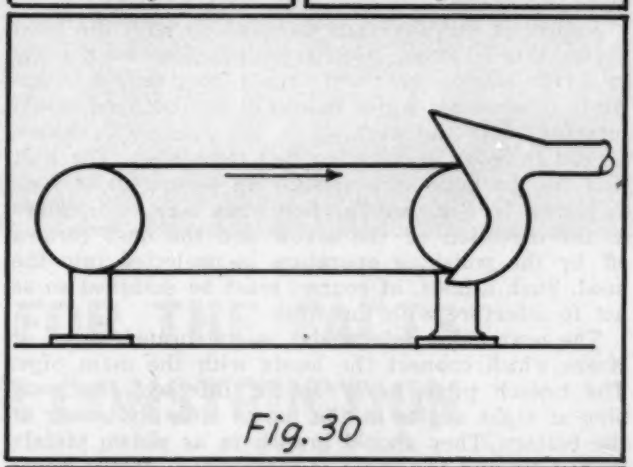
"The common type of galvanized steel hood installed by plant workmen without expert supervision, is a type of hood which causes much trouble. In many cases the hoods are practically worthless due to the fact that the branch pipe connection to the hood is not placed in the proper position to catch the dust as it is thrown from the wheel. . . . The dust from the polishing and grinding operation is thrown from the wheel at a tangent from the point of contact of a piece of work on the wheel. If the exhaust hood or pipe connection to the hood is not located so that this stream of dust will enter directly into the mouth of the branch pipe or in the case of the overhead hood directly into the mouth of the hood the speed with which this dust is thrown from the wheel will carry it past the exhaust hood or pipe even though the velocity of exhaust is very high."

Illustrations shown in Fig. 27 are taken from the bulletin in question. The one at the top is: "A poorly designed hood, branch pipe connection too far in the rear." At the bottom is a "Well designed hood."

In theory Messrs. Winslow, Greenburg and Angermeyer are correct but in actual practice, however, this principle is not always followed. In Fig. 28 are shown three common hood types that are considered efficient. Referring especially to the two hoods at the top of the figure, it will be seen that they do not conform with the above specifications. Referring to the two hoods in question, it is shown that the exhaust pipe connection is at the back and not tangent with the work surface as the work is applied to the wheel. With the two hoods under consideration the theory is that the heavy particles of metal and abrasive will be thrown into the receptacles at the bottom of the hoods while the vacuum created in the exhaust system will carry away the dust. This practice is very desirable inasmuch as the excess abrasive in the exhaust system tends to cut out the exhaust pipes and the fan blades. Thus any means to retain this abrasive without injury to the effectiveness of the system is to be recommended.

While the hoods shown in Fig. 28 are adaptable to the majority of polishing operations, special hoods must be used in many cases. For example in Fig. 29 is shown a hood for a polishing wheel wherein the wheel turns away from the operator. Many such





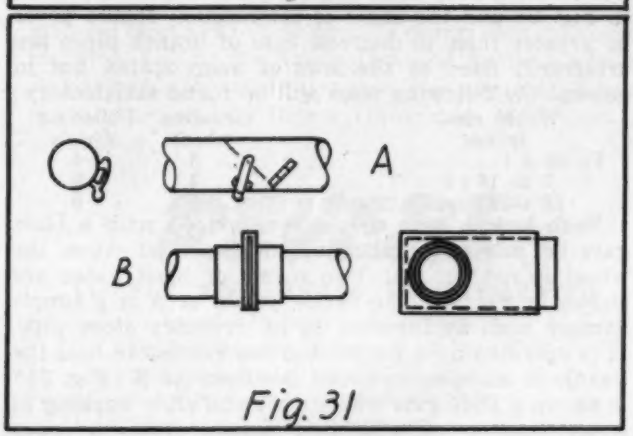
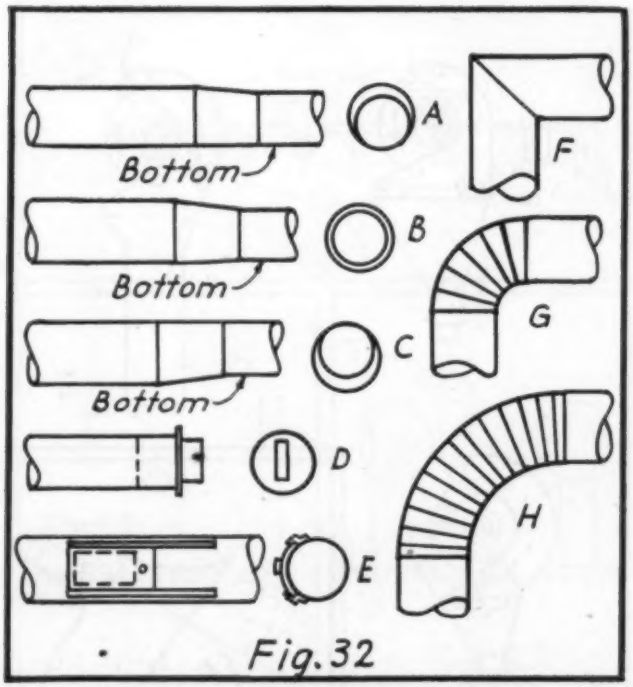


Fig. 28 shows three common types of hoods. Fig 29 shows a hood for a wheel turning upward. Fig 30 shows a belt and hood (work should he done near the hood).



Transformation (A) is preferred. (B) is not as good as (A) and (C) should never be used. (D) and (E) show cleanouts. Elbow (F) should never be used; (G) shows more resistance than (H). Give elbows a radii of 2½ pipe diameters if possible.

wheels are used. For example, grinding and polishing wheels used in ax factories are operated in this manner.

Nature of the work has much to do with the hood design. For example, wheels for polishing such parts as scythe blades, bayonets, swords, etc., cannot be entirely covered by hoods inasmuch as the hood would interfere with the work. It is not possible to design a hood to cover a polishing belt completely. The best that can be done is to design an arrangement such as shown in Fig. 30. The belt runs over two pulleys in the direction of the arrow and the dust thrown off by the polishing operation is projected into the hood. Such a hood, of course, must be designed so as not to interfere with the work.

The next point to consider is the branch pipes or risers which connect the hoods with the main pipe. The branch pipes never should intersect the main pipe at right angles at the top or side and never at the bottom. They should branch in as shown plainly in Fig. 21 and the angle of intersection should never be greater than 45 degrees. Size of branch pipes are arbitrarily fixed by the laws of many states, but in general the following sizes will be found satisfactory:

Wheel size, inches	Grinding wheels	Polishing wheels
To 66 x 1	3	4
7 to 16 x 2	4	5
17 to 24 x 4	5	5

Each branch pipe should be provided with a blast gate or means for shutting off the blast when the wheel is not in use. Two forms of blast gates are shown in Fig. 31. The device shown at A is a simple damper such as inserted in an ordinary stove pipe. It is operated by a handle and has catches to hold the handle in an open or closed position. At B (Fig. 31) is shown a slide gate wherein a metal slide working in a cast iron or malleable iron housing closes or opens the pipe.

In determining the size of the main pipe, or trunk duct, a general rule is to make each section 20 per cent larger than the sum of the openings leading into it. The increase should be added at the top of the main if possible. The design of transformation piece shown at A, Fig. 32, is to be preferred to that shown at B. A pipe placed in the position shown at C never should be considered. At D is shown a cleanout cap for the end of a main pipe. At E is shown a cleanout gate. The detail is self explanatory. One of these should be placed in at least every other length of main pipe connection. This gate is a simple slide with a radius to conform to the outer pipe diameter. The gate should be twice the length of the slot it covers so as to avoid cramping. As shown at E, the gate is held in place with two slides, one on either side as shown. At F, G, and H are shown three types of elbows. The design shown at F never should be used as it increases the static pressure requirements tremendously. The rule is to use elbows sparingly for no matter how well they are designed they increase the resistance of the system materially. The elbow shown at G will offer more resistance than the one illustrated at H. A general rule is to make the elbows with a maximum radius equivalent to two and one-half diameters which tends to keep the fan load at a minimum.

The fan must be selected to handle the designed volume of air at the static (or resistance) pressure created by the duct system. Through long practice, manufacturers of dust collecting and disposal equipment have formulated tables of minimum velocities for conveying various types of material. A duct velocity of air at 70 degrees, F., of 4,500 feet per minute is considered sufficient for the removal of dust from heavy grinding and polishing. Thus velocity pressure pertains to the flow of air through the system, static pressure is the resistance to that flow caused by the piping, etc., and the sum of the two is called the total pressure. Thus the fan must be of sufficient capacity to take care of the total pressure.

In determining static pressure on straight piping it has been found that a pipe 40 times as long as its diameter causes a resistance to the flow or friction pressure equal to the velocity pressure existing in the pipe. For example, if we have a 30-inch diameter pipe with air traveling through it at a velocity of 4,000 feet per minute, corresponding to a velocity pressure of one inch water gauge (pressure sufficient to displace one inch of water in a U tube) we will find that for every 100 feet of straight pipe (which is 40 times the diameter) the resistance will equal one inch water gauge.

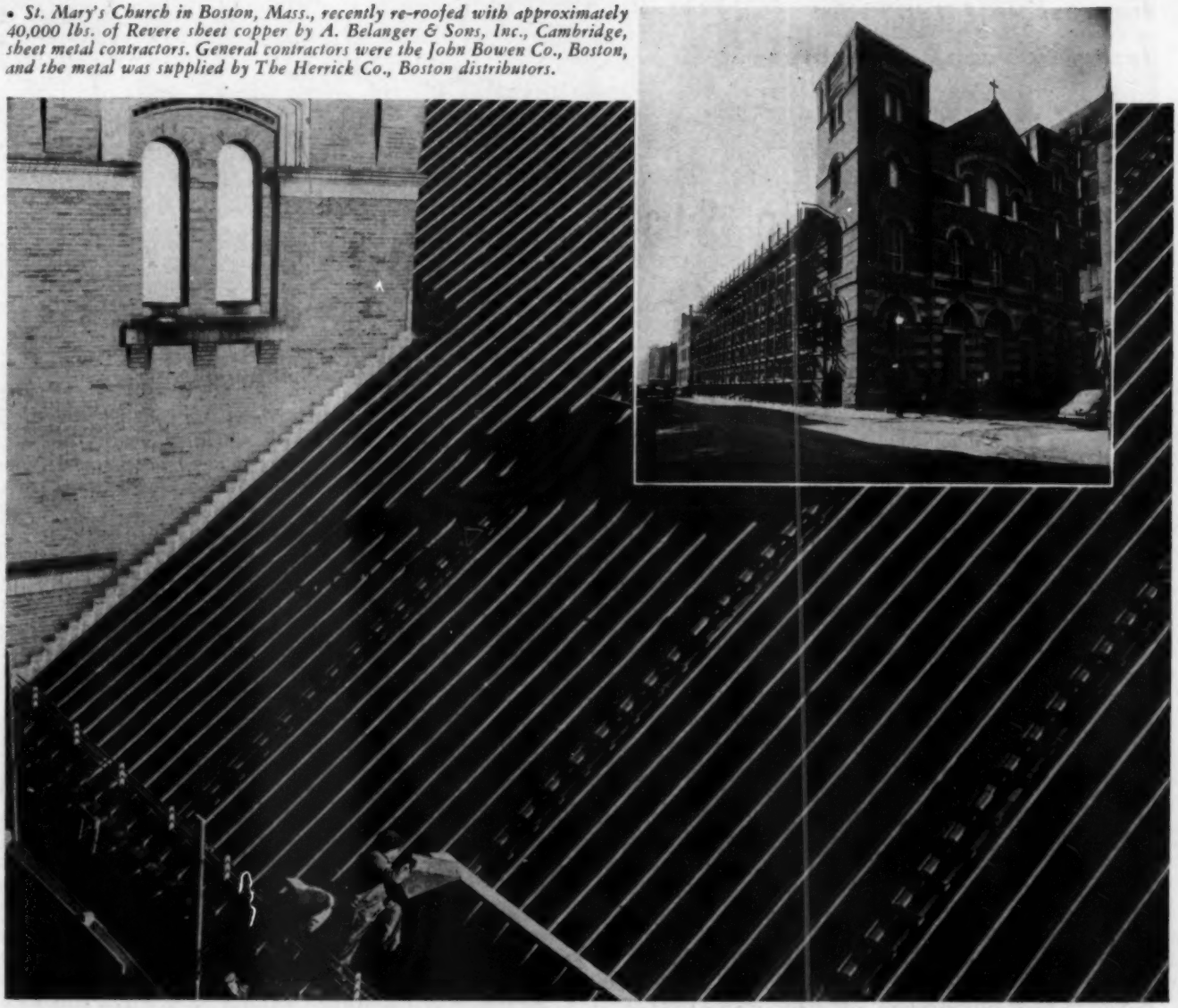
Thus with the foregoing as a basis it is a simple matter to figure the static pressure of the system. The resistance on the intake side of the fan must be added to that of the discharge side in determining the static pressure which the fan must operate against.

Also there is a legal side to the question of dust removal from grinding and polishing rooms. Ten states have laws of this kind while the states of Illinois, Michigan, New Jersey, Ohio and Wisconsin have adopted laws wherein the character of the equipment is defined. Otherwise the various state laws simply state that injurious dust must be removed as far as practicable or as far as the nature of the business permits. Such laws are of course gotten around readily.

Thus in one state the laws pertaining to abrasive dust removal might be quite severe. For example, the Wisconsin law states that the air velocity must be sufficient to displace a column of water in a U tube

(*Continued on page* 138)

• *St. Mary's Church in Boston, Mass., recently re-roofed with approximately 40,000 lbs. of Revere sheet copper by A. Belanger & Sons, Inc., Cambridge, sheet metal contractors. General contractors were the John Bowen Co., Boston, and the metal was supplied by The Herrick Co., Boston distributors.*



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Impressive Attendance

Industry Problems Feature

Ohio State Convention

OHIO'S first state association convention held since 1941 demonstrated in its attendance that interest in state association affairs in Ohio is far from dead—there were impressive delegates from Akron and Columbus; several contractors from Cleveland and Cincinnati; and a very satisfactory attendance from the many smaller cities in the state.

President Carl Gundlach, summarizing association needs, said he believed one thing necessary is a full-time secretary; also a committee to act in Columbus in matters pertaining to codes and legislation; also a standards committee to raise the standards of design and installation practice throughout the state; also a committee to work for the protection of the industry. He emphasized the importance of adequate bookkeeping and cost accounting and suggested that through committees it might be possible to establish certain pricing sugestions which, if followed, would aid contractors in obtaining a profit from their work. He reported that a survey indicates there must be approximately 900 contractors in Ohio, scattered between twenty to thirty fair sized cities and many smaller communities, but that the state association because of the impossibility of holding meetings during the war has lost membership until the association now stands at fewer than 200 paid-in-full members. One aim of the association, he said, should be to increase the state membership so that the association might be truly representative of the industry in Ohio.

Management for Profit

First of the addresses was a discussion of Management for Profit by J. D. Wilder, editor, American Artisan. The speaker suggested several items of management which contractors might consider: First, financial management—not the mere practice of turning over to a bookkeeper the production of certain records and reports from time to time, but, instead, a close study by the contractor of the various costs required to operate a business and if possible a budget-profit system, which when properly set up will show from month to month the total volume of sales, the total dollars of cost, and a budget based upon the preceding year's operations showing what the concern expects to do in the current year. The speaker explained how such a budget-profit system establishes a goal to shoot at and keeps costs in line with sales or discloses quickly when sales or profit or costs are falling outside the budget.

The speaker also suggested serious consideration of overhead. Overhead based upon productive labor or upon labor and materials as established by costs one or five or ten years ago is not out of date under present conditions; the contractor should set up a system of overhead control which takes into account the increasing cost for supervisory labor, stenographic and office help, executive salaries, taxes, insurance, and all the other items which now must be accounted for. The speaker also suggested that bookkeeping and cost accounting and overhead control are not complete when the contractor receives at proper intervals reports for sales taxes or unemployment compensation or old age insurance, etc.; these reports add nothing to profit; they do not make a business grow; they contribute not one single idea toward the contractor's profit.

On the matter of reducing costs, the speaker suggested that contractors give attention to the possibilities of using new machines or tools or shop procedure which enable mechanics to turn out more work at the expenditure of no greater amount of labor because all concerns are now faced with the problem of increased labor costs. How much this increase in labor rates will be, no one knows but certain examples indicate that contractors may expect approximately fourteen per cent increased wage rates in 1946.

Contractors should not wait for labor to make demands, but should, if possible, establish a procedure known to both management and labor which will automatically increase or decrease wage rates. One such plan is in operation in Seattle, Washington, where automatic increases or decreases in wages occurred twice a year, according to increases or decreases in the Department of Commerce, Index to Living Costs.

In conclusion, the speaker cited financial reports for small, medium and large concerns which indicate that in general the net profit taken from businesses in our field is too low. For instance, one concern doing a gross of $7,000 showed a net profit of $577. Assuming this operator did all his own work and adding the direct labor amounting to $1,970 to the profit of $577 gave the operator only $2,548 for a year's work. Another shop with total sales of $16,000 showed a net profit of $521 and a direct labor cost of $5,066, or a total of $465 a month, but to contribute all this labor directly, the owner must install perhaps thirty furnaces a year, which would be a very difficult task. For forty-six shops in a given area, the total salaries drawn were $84,577 and the total direct labor $11,173, making a total of $95,750, or $2,324 for each one of the 46 shops. This is not enough profit from the operation of a warm air heating or sheet metal shop and the operator in such a predicament should either close up the shop and go to work for some other employer or he should take time to plan his business so that it will grow and make it worth while to operate.

Sheet Metal Contractors National Association

Patrick Varden of Albany, N. Y., president of the Sheet Metal Contractors' National Association, stated emphatically that the whole industry needs now to be well organized and strong, both nationally and statewise, if the industry is to meet the many problems which confront us. There must be a greater interest in all of the affairs touching our industry, he said, and unless such interest is evidenced in state and national association problems, it will be only a matter of time before work will be taken away from us and restrictions will be applied which will be detrimental to our good. That our craft is a very important one in the construction industry, President Varden pointed out, is indicated by the fact that no other trade requires the high degree of skill in mechanics, no other trade requires the investment in machinery and shop equipment and no other trade in the construction industry so directly affects the welfare and health of men at work and families at home as does ours.

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Joseph Dersher, Toledo
William Feiten, Cleveland

President Varden pointed out that during the war years Washington agencies gave little weight to our trade, in fact such little weight that in most regulations the warm air heating, sheet metal and ventilating industries were placed under the jurisdiction of other trades. The National association can help state associations and local associations and even individual contractors to obtain proper recognition if contractors will pitch in and contribute time, money and effort. The National association now is represented in forty-two states and is increasing in membership month by month. The National association intends not only to make itself strong, but also to help state associations and local associations also reach a strong and useful standing. Only if State and National associations are strong can the industry expect to get its proper share of the construction dollar.

President Varden stated a recent survey indicates that roofing is now obtaining 80 cents to $1.20 out of every $100 of the construction dollar. Sheet metal shows $1.00 to $1.40 out of every $100. Roofing and sheet metal combined show from $3.60 to $4.10 out of every $100. By contrast with these figures, the same survey indicates that heating now takes $5.30 to $7.40 out of every $100; plumbing takes $5.60 to $7.70 from every $100; electrical work takes $4.70 to $9.70 out of every $100 of the construction dollar. These figures, said President Varden, indicate very plainly that our craft needs to obtain a larger percentage and we will obtain this increased percentage only through strong association organization.

President Varden explained how our industry for several years has been losing work to other industries, as for example losing copper pans and tubes in favor of cast iron drains which are placed in the plumbing contract; much sheet metal and blowpipe and ventilating work is going into the plumbing industry by way of "package units"; steel roof decking which definitely has been allotted to the sheet metal industry is being installed by structural iron workers. Metal ornamentation which used to be a large part of our business has gone for good, but it is somewhat doubtful if the new type of buildings are any better or as good as the older ornamented and protected buildings using copper, galvanized iron and many of the other materials of our industry. The speaker concluded by urging all contractors in the audience to obtain from the national secretary's office a copy of the national association's plan and program which gives in detail the aims and intentions of the national association.

National Association Report

National Secretary Clarence J. Meyer reported that the Sheet Metal Contractors' National Association is now out of its swaddling clothes and is represented by membership from 42 states. Secretary Meyer said the association has accomplished a considerable number of things in the past two or three years, despite many difficulties; contractors now find that their earlier hope for a rapid reconversion has not been solved and too many people have money to spend but nothing to buy. Contractors in general are unable to furnish the material and work requested by customers because of material and equipment shortages. The individual can do very little to meet these problems of 1946, but organization through state and national association may be able to assist contractors in obtaining material and equipment and a fair share of the building dollar.

Secretary Meyer reported that the association believes the OPA has been one of the biggest stumbling blocks to reconversion. That the OPA did a good job during the war in keeping costs down is granted by everyone, but many people now believe OPA has outlived its usefulness and drastic reorganization is called for. In a large measure, the OPA has been responsible for the present sheet shortage and shortage of heating and other equipment, because manufacturers simply will not produce materials unless there is a profit connected with the production.

As to the future national association plans, Secretary Meyer reported that the association intends to disseminate much useful information and data throughout the industry. Through committees, a bookkeeping and cost accounting and estimating system is being worked upon and perhaps will be made available to members in 1946; standards of design and installation have been put together and will be distributed in increasing quantities as the months go by; the association has already received acceptance for its recommended apprenticeship training program and has also obtained approval on the bid-peddling resolution from the architects and general contractors.

Some Government Problems

James Dailey of the United Commercial Travelers Association, speaking at the luncheon meeting, declared that much of our trouble stems from the fact that government is no longer an umpire, but has become a participant in business affairs as well as in legislative matters. He pointed out some of the many

(*Continued on page* 134)

The New York State Convention

NEW YORK State Sheet Metal, Roofing and Air Conditioning Contractors Association's twenty-third annual convention, held April 2nd and 3rd in Buffalo, N. Y., attracted all of the long-time members who have made this association such an important factor in the industry, plus a very satisfying number of new faces from many of the smaller communities throughout New York State.

Readers of AMERICAN ARTISAN who have followed reports on previous New York State conventions know that New York State has in Mr. H. A. Daniel of Newburgh, N. Y., a "resolutioner" par excellence. In view of the confusion existing in the construction industry at present, Mr. Daniel, as chairman of the resolutions committee, found a very fertile field in which to "resolution" and, accordingly, one of the highlights of the convention was the resolutions prepared, accepted, and put into process. So that other association members throughout the country may understand what this active group believes to be necessary problems for action, we reproduce in brief with this report the resolutions passed at the New York State convention.

The New York State Association, operating as an insurance group, has in the past several years established a splendid record; figures presented by the insurance group managers, Laverack and Haines, showed incomplete figures indicating approximately $106,000 of premiums paid by 97 members. The report indicated that accidents in the group are not increasing in number, but several of the accidents have been severe. Chief among the causes of these accidents are failure of ladders and scaffolds. The managers suggested that with some additional attention paid to ladders and scaffolds and other forms of accident prevention, it is quite likely that the group will show a still further decrease in accident number and severity. If available, a full report of this accident insurance group will be published in AMERICAN ARTISAN later this year.

Nat'l Warm Air Ass'n

The convention devoted practically one entire session to discussion of the two national associations. George Boeddener, Managing Director, National Warm Air Heating and Air Conditioning Association, described

Resolution No. 1

John D. Small, Administrator
Civilian Production Administration
Washington, D. C.

WHEREAS, during the war years, property has in general greatly deteriorated because of lack of materials and labor, and

WHEREAS, vast amounts of materials, such as galvanized sheets, roofing tin, roofing felt, furnaces, and repair parts are needed as never before, and

WHEREAS, a serious shortage exists in many of these items, which will result in much further damage to buildings and equipment, and a devastating loss of employment, unless materials are made available in reasonable quantities, therefore

BE IT RESOLVED, that the Civilian Production Administration be urged to adopt immediately measures to insure sufficient materials to take care of reasonable needs of the owners of buildings urgently in need of materials for the necessary repairs and upkeep.

Resolution No. 2

WHEREAS, the most amazing progress of any country of the world is that achieved by the United States of America, and

WHEREAS, this wonderful development has been possible only through our system of free enterprise, and

WHEREAS, our recovery and the production of goods are being retarded by unwise policies adopted by bureaus in Washington, and

WHEREAS, these crippling policies are encouraging inflation by hampering production, and

WHEREAS, the war is over and it is essential that we return to normal conditions as soon as possible, and

WHEREAS, these various war-born bureaus, boards, etc., were set up to meet war emergencies, which no longer exist, therefore

BE IT RESOLVED, that the Congress of The United States of America be urged to liquidate these various boards at as early a date as the Congress may deem wise, but in no case later than December 31, 1946.

Resolution No. 3

WHEREAS, millions of our young men, who have been in our Armed Services for periods of from a few months to five years or more, are returning and want to establish homes of their own, and

WHEREAS, their ambitions to live a normal life are being frustrated by the lack of suitable housing accommodations,

BE IT RESOLVED, that we request the Congress of the United States to do its duty by establishing a commission of **practical builders, architects, and engineers,** with a practical builder as head of the commission and with authority given the commission to allocate building materials and supplies on a priority basis, so that veterans and their widows, and dependents will be taken care of ahead of others, except where extreme hardships may be involved, such as the burning of a home, a school, or a hospital. This commission to have full authority to handle all the problems involved, without interference from any other government agency.

BE IT FURTHER RESOLVED, that no bonuses of any kind or amount be paid for the production of any materials or supplies needed because such will not be necessary if the commission is given full authority to take whatever steps it may find necessary, and

BE IT FURTHER RESOLVED, that if any bonuses are to be paid, they shall be paid to such veterans, their widows, or such other dependents who may need housing relief and who decide to take advantage of the rights offered in this bill. Such relief might be a cash payment to the veteran, or his widow, or dependent, to the extent of the difference between the present maximum cost of a building, as required on G. I. loans, and the actual cost; or the relief could be extended by the Government by cutting the interest rate from 4% to 2%.

Surely if the Government is justified in loaning money to foreign countries at 2% or less, it will be justified in loaning money to our veterans, and their widows, and dependents, to enable them to become home owners, at 2%.

the new dealer division of this association. Research leading to booklets and bulletins has been of vital benefit to the industry, said Mr. Boeddener; research began in 1918; almost 250,000 booklets and bulletins have been distributed. The National Warm Air Association expects to sell the well-known research residence at Urbana, and to build this year a new research residence which will cost perhaps $25,000.

More than $60,000 has been set aside from association funds to conduct research, mostly in Urbana, in 1946. From the announced national advertising campaign, including the dealers' division and jobbers' division activities, as reported during the past year in AMERICAN ARTISAN, some $100,000 has been obtained and will be used for several new activities. One such activity is approximately thirty dealer engineering training schools to be conducted all around the middle west in 1946, under the direction of G. A. Voorhees, well-known heating engineer. Immediately, Mr. Voorhees will stage six schools for the purpose of determining proper procedure. After these pilot schools have been completed, the remaining 25 or 30 schools will be conducted as soon as arrangements can be made with local associations or interested groups of heating dealers.

The association, explained Mr. Boeddener, has recently released sections I, II, III, V and VII of the new Warm Air Heating Manual. Also, distribution is continued of the well-known Yardstick. At the time of the New York convention, the dealers' division consisted of 225 members who have paid in approximately $15,000 in dues. Most of this money will be used to conduct the dealers' schools described above.

OFFICERS

President—Charles R. Joyce, Albany.
First Vice-President—Clarence Williams, Rochester.
Second Vice-President—Joseph Stiglmeier, Buffalo.
Secretary—Clarence J. Meyer, Buffalo.
Treasurer—William C. Kirkpatrick, Buffalo.
Immediate Past President—Patrick S. Varden, Albany.

DIRECTORS

Term expires 1946: H. A. Daniels, Newburgh, and A. C. Hall, Elmira.
Term expires 1947: Frank J. Townsend, Mt. Vernon, and James F. Keays, Albany.
Term expires 1948: Harry Fitch, Rochester, and J. Arthur Heaphy, Syracuse.

Almost $50,000 will be spent in publicity and promotion, including a campaign of national advertising in consumer and technical magazines and in the preparation of booklets for home owners, architects and building contractors.

Mr. Boeddener reported that on January 15, the National Warm Air Association began asking Washington for a status as "critical" for furnaces, warm air pipe and fittings, registers and grilles, and other accessories. No action was obtained from Washington during January or February. CPA has estimated that about 900,000 furnaces are required—565,000 for Veteran housing; about 35,000 for non-rated new house construction; and approximately 300,000 furnaces for replacement work. The warm air manufacturers report potential production capacity of approximately 1,000,000 furnaces, but at the present moment, due to labor difficulties and material shortages, the industry is producing at no more than a fifty per cent rate.

Panel Heating

Mr. Boeddener reported that the association, in its publicity and advertising campaign, intends to tell the public the actual facts about panel or radiant heat. The warm air industry, said Mr. Boeddener, has many advantages in forced warm air heating to explain to the public: Ventilation, air circulation, air cleaning, humidification, all of which are impossible or impracticable with panel heating. The apparent popularity of panel heating, said the speaker, must be based upon a desire of the public to purchase something which eliminates "cold 70" and cold floors, but the public has not seen panel heated houses and has very little understanding of just what a panel heating system is or what are its limitations. To explain these things in detail and factually will be the purpose of these association's national advertising campaign and publicity material.

Nat'l Sheet Metal Ass'n

President Patrick S. Varden of the Sheet Metal Contractors' National Association, described briefly some of the activities this national organization has put into effect in the last twelve months and described vividly the program which the association proposes to follow during the next year. Mr. Varden stated that even though there are a number of very active state associations all doing an excellent job for their members, there still remains the need for a strong national association which can head up all the activities of the state associations and which can, through national committees, correlate, study, and propose solutions to our own pressing problems.

One example of what a national association can do, said President Varden, is illustrated in the poor acceptance given state and local associations by Washington agencies. In most cases our industry operated under other industries insofar as orders and regulations were concerned. Not only Washington, but other national groups such as architects, general contractors, etc., said President Varden, have too little understanding of the importance of our craft in the construction industry. No craft in the construction industry does such a wide variety of work as we do. Our activities extend into all the ramifications of providing health and comfort for men at work and families at home. No other trade requires so much knowledge of a technical nature, nor requires such a large investment in shop equipment and trained men.

President Varden reported that the National Association now has members in forty-two states and is growing consistently. The National has assisted in reorganizing and reactivating some local and state associations and it is expected that this effort will be widened in the next few months.

President Varden declared that one major activity of the National must be to protect our trade and obtain a greater percentage of the building dollar. As an indication of where we stand in construction, President Varden cited figures which show that out of every $100 of construction the roofing industry gets only 80 cents to $1.20; sheet metal work alone gets only $1.00 to $1.40; roofing and sheet metal work combined get $3.60 to $4.10; heating (including residential) gets $5.30 to $7.40; plumbing gets $5.60 to $7.70;

(Continued on page 124)

Southern California Sponsors Schools

THE Institute of Gas Heating Industries of Southern California sponsors classes for heating dealers and their representatives, in which the fundamentals of heating equipment and its operation are taught both by lecture and actual practice with controls and other equipment. Two eight-week classes have recently come to a close, one class being held in the auditorium of the Southern California Gas Company's building in Pasadena, California, and one in the Company's auditorium in the Hollywood office. Approximately one hundred students attended the classes at each meeting.

As members of the Institute, dealer training representatives Bob McKee and Paul Speers, of the Gas company conducted the classes.

The Southern California Gas Company also cooperates with plumbers' groups, furnishing instructors and equipment for complete courses in maintenance and operation of water heaters and heating equipment.

The course consists of combustion; venting; fundamentals of electricity, safety pilots, push button controls, wiring push button controls; forced air furnace controls; wiring forced air furnace controls; thermocouple operated controls and the Los Angeles warm air heating ordinances.

R. E. "Bob" McKee

The class members were asked to bring tools, because the greatest part of the time was spent in working on genuine controls that were connected to gas and electricity.

The "learn by doing" method comprised four steps:

1. Control sets were disassembled and each part was explained.
2. The control sets were reassembled and adjusted to function properly.
3. The signal was given to throw all controls out of adjustment and to remove all wires.
4. The control sets were then exchanged and put back in operation by other members of the class.

At the end of each session, questions were passed out to be answered and returned to the next meeting. The questions covered the evening's activity plus a section of the heating ordinances.

Members attending six out of the seven meetings and obtaining a satisfactory average on the questions were awarded a Certificate of Attendance signed by the president and secretary of the Heating Institute. The "diplomas" were presented in true graduation style at the Mayfair Hotel, Los Angeles, on March 14, 1946.

Approximately one hundred certificates were awarded. The average grade was around 88 per cent, with the highest grade 100 per cent and the lowest 71 per cent.

Left—The instructor presents theory and basic heating information. Right—The class "learns by doing." Actual practice is given in installation and servicing of all types of heating equipment.

ASSOCIATION ACTIVITIES

Erie, Pennsylvania

The Sheet Metal and Roofing Contractors' Association of Erie, Pennsylvania, met recently. Dinner, prepared by Amity Inn, was served at the Gust Krack Company's recreation rooms at 1015 W. 18th Street. Following the dinner, the evening was spent at cards.

Present officers of the association are:

President .....John Henke
Vice-President .....Leo Auer
Secretary-Treasurer .....Harrison C. Hartline
Trustees: Charles Stough, George P. Auer, P. S. McCreary.

A building is no better than its roof and a city no better than its buildings, is the principle on which members of the Erie Association view their business and service to

Left to right, front row: H. J. Braggins, Wm. Krack, S. G. Warren, H. G. Hartline, Walter Neth, Robert Warren, Harold Simmons, George P. Auer. Standing: Charles Stough, Louis C. Trost, Melvine Hartline, Harrison C. Hartline, secretary; John Henke, president; P. S. McCreary, Ben McCreary, and B. A. Buman. (Times photo)

the city. Many buildings which would be economically priceless to Erie have suffered decay and ruin for the lack of proper roofs and the neglect of owners who have failed to repair, maintain or reroof when new roofs were needed.

The oldest roof on a residence in the city of Erie, made of metal, is that of Captain W. L. Morrison, near the Erie Public Museum. The roof is 85 years old. It is a tin roof and has been painted when a coat of paint was needed.

The oldest roofer in the city is the shop of J. H. Braggins, now operated by his son, H. J. Braggins at 152 W. 12th Street. The Braggins business was established in 1880 and was located at 404 W. 8th Street, Erie.

Probably the oldest roof in the city is the one on the Old Custom House, the home of the Erie County Historical Society. It is a copper roof more than a century old.

Harrison C. Hartline, Secretary.

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Carolinas

The Carolinas Roofing and Sheet Metal Contractors' Association will hold their annual meeting at the Washington Duke Hotel, Durham, N. C., on June 13th and 14th. J. Victor King is chairman of the Public Relations Committee.

The Carolinas Roofer, Vol. 4, No. 4, urges members to use the emblem on their stationery. Cuts are available from Secretary Horace T. King, Box 1088, Wilmington, N. C.

Three new members are introduced in the April issue: Long Brothers of Gastonia, N. C.; Nicholson, Inc., Durham, N. C.; and Walton Roofing Co., Durham, N. C.

On-the-Job training for veterans is mentioned, and steps necessary to place the veteran in the program are listed.

A flashing sketch shows the proper method where a one-story roof joins a two-story part of the building on a brick veneer job.

J. A. Piper, Editor.

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Buffalo

A dinner meeting of the Buffalo Sheet Metal, Warm Air Heating & Air Conditioning Association was held at the Markeen Hotel, Buffalo, on April 3rd.

The Civilian Production Administration's order controlling building materials for veteran's homes was explained and contractor members advised to operate within the limitations of this new regulation.

Members were urged to submit financial statements to Dun & Bradstreet, Inc., to be sure of having a rating since it was felt such procedure might assist in getting their orders filled during this period of material shortage. They were also called upon to watch their estimates during these inflationary times.

The first, in a series of three short course periods, started using the Code and Manual as the text book. The latest method of estimating heat losses was outlined. This course will be continued through the May and June meetings.

A new furnace sales policy was introduced which amounts to a straight dealer sales plan, all furnaces and accessories to be sold through the dealer trade. This policy will be put into effect at the May 1st meeting and will cover all transactions in Western New York State after that date. Attendance 68.—M. J. Rodman, Secy.

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NFPA's Fiftieth Anniversary

The fiftieth anniversary meeting of the National Fire Protection Association will be held in Boston, June 3-7, 1946. Hovey T. Freeman, Secretary-Treasurer, 60 Batterymarch Street, Boston 10.

COMING CONVENTIONS AND MEETINGS

May 2-4—Sheet Metal Contractors' National Association, Inc. Convention. Hotel Statler, St. Louis. Clarence J. Meyer, Natl. Secy., Buffalo 4.

June 3-4—Stoker Manufacturers Association. Annual. Broadmoor Hotel, Colorado Springs, Colo. Marc G. Bluth, Secy., 307 N. Michigan Ave., Chicago 1.

June 3-7—National Fire Protection Association. 50th Anniversary. Boston, Hotel Statler. Melvin R. Freeman, Public Relations Manager, 60 Batterymarch St., Boston 10.

June 13-14—Carolinas Roofing and Sheet Metal Contractors' Assn. Annual. Washington Duke Hotel, Durham, N. C. J. Victor King, Chairman Public Relations Committee, Sanford, N. C.

July 12-21—Construction Industries Exposition and Home Show of Southern California. Pan Pacific Auditorium, Los Angeles. Tabery Corporation, Managers, 3443 S. Hill St., Los Angeles 7.

Association Activities . . .

Indiana

The Sheet Metal and Warm Air Heating Contractor's Association of Indiana has mailed announcements of their two-day refresher course, sponsored jointly by the Indiana group and the National Warm Air Heating and Air Conditioning Association for members and non-members, at Indianapolis on Tuesday and Wednesday, April 23 and 24, and/or Fort Wayne, Tuesday and Wednesday, May 7 and 8.

Ten dollars will cover all materials and books.

Classes can accommodate only a maximum of fifty contractors. Address Fred E. Jackson, Secretary, 944 Hosbrook St., Indianapolis 3.

The March 1 bulletin of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc., lists the officers and directors elected for the coming year, and reports to members the success of the annual convention with 250 in attendance.

Fred E. Jackson, the new secretary, is the intermediary between members and the organization. He is devoting his full time to the organization, and as the association field man, will visit members as frequently as possible and will be at their service for information regarding the industry. His primary purpose in covering the state, is to build up the membership of the organization. In checking with each member, he can ascertain the elibilibity of potential members in each district. President Walker invites the aid of all members in the efforts of Mr. Jackson to build the association so that Indiana will never take a back seat in this industry—for the interests of the organization, to have a strong and independent security, bigger and better conventions and year-around service.

Members are fighting for furnaces and sheets. Secretary Jackson urges that members get all orders in now for future deliveries. He warns to differentiate between letters and purchase orders; to use an order blank which will be dated and filed accordingly. Prices are changing, so don't figure too far ahead. Furnaces and sheet metal materials for future delivery can not be sold at present prices. Strikes have delayed the recovery schedule by about three months.

James R. Walker, President.

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Stoker Manufacturers Directors Meet

The Board of Directors of the Stoker Manufacturers Association met the first week in April in Chicago and passed a resolution urging that stokers be removed from OPA control on price ceilings;

Approved plans for the 1946 annual business meeting and convention to be held at Colorado Springs, Colorado, Broadmoor Hotel, on June 3 and 4;

Approved a 1946 financial operating budget which will be reported to the membership at the annual meeting;

Approved renewal of the association's membership in the Chamber of Commerce of the United States, National Industrial Council, and the Plumbing and Heating Industries Bureau;

Approved the appointment of Technical Director Lloyd L. Connell as a member of the Standards Equipment Committee of the Smoke Prevention Association;

Approved a proposed revision of the association's By-Laws concerning membership dues and special assessments, to be submitted to the membership in writing in advance of the annual;

Appointed a special committee to meet with a special committee of the sales executives representing the Bituminous coal industry to confer on problems and subjects of mutual interest.

Fox Valley, Illinois

The Fox Valley Furnace & Sheet Metal Contractors' Association, met on March 19.

A motion was made, seconded and passed that the forms for the Veteran Training Program be sent to paid up members of the association. It was voted that the get-acquainted night be held at the Joe Strotz shop in Aurora and that he be recompensed for the use of his facilities at the usual rate.

Member Glossop remarked that he was at the Wisconsin meeting and the scarcity of units was the main topic of conversation. He reported the increase of 12½ per cent on units gas and oil, 35 per cent per ton on steel sheets—8 2/10 per cent on stainless steel.

There was discussion on re-price mark-ups, and new types of gas heating.

George Bushman invited the members of the Fox Valley group to Peoria on April 8 and 9 to meet the Illinois Sheet Metal Contractors Association.

Members present were: Jack Stowell, Fred Lamp, Andy Lind, Bill Stevens, Don Glossop, Joe Strotz, Mylo Walker, George Roesch, George Bushman, Charles King, Charles Heffelfinger, Walter Eissler, George Lehnert, William Klinkley, Fred Nolting, Clayton Evenlien.

William B. Stevens, Secretary.
79 S. La Salle Street, Aurora.

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Southern California

The minutes of the January 10 meeting of the Institute of Gas Heating Industries called to order by President Frank W. Lawson at Stevens' Nickabob Cafe, lists Henry B. May as a new member.

President Lawson appointed the following committees and chairman for this year:

Membership: Chairman E. J. Grau, C. R. Horsley, Glenn Ashburn
Ordinance: Chairman Art Theobald, Stanley Johnson, Harry Warren, Lou Hull, A. B. Wicks
Advertising and Publicity: Chairman H. M. O'Haver, Tom Pinatelli, C. A. Gabriel, James Hess, George Merkle
Hi Jinks: Chairman F. F. Alleman, Tom Tatone, F. J. Ward
Educational: Chairman R. E. McKee, Glenn Ashburn, F. W. Heisinger
OPA Pricing: Chairman Pete Banowsky, Glenn Ashburn, R. H. Morris
Santa Monica Ordinance: Glenn Ashburn

A motion was made by Leo Hungerford, seconded by Lou Hull, and passed that we have a bond lottery at each meeting—tickets 50c each or three for $1.00.

A motion was made by Gene Grau that past presidents should have some memento and thanks of the Institute for their services and suggested a pen and pencil set be presented to each of the past presidents—seconded by F. W. Heisinger—and passed.

President Lawson stated that it had been brought to his attention that many installations of heating equipment were of very poor quality and were being made without obtaining permits. He urged members to police within reason such a practice and to further the Institute's purpose of improving installations.

There was discussion on OPA, MPR-591, Order 48, Amendment 4, applying a 12½ per cent increase to furnace price lists of October 1, 1941.

At the February 14 meeting, J. R. Vein of OPA was most helpful in answering questions and discussing OPA policies.

Art Theobald reports the Ordinance is still gathering dust on the City Attorney's desk. At his suggestion a committee, composed of Art Martinson, Glenn Ashburn, Al Guenther and Pete Banowsky, was appointed to appear before the Board of Building and Safety to urge the passage of the ordinance.

Glenn Ashburn reported the Santa Monica ordinance was pending the approval of the Council and indicated early adoption.

H. Wendell gave an account of his experiences while a Jap prisoner. The February bond was drawn for A. E. Wedemeyer, guest. Three bonds for the March 14 meeting.

R. O. Montrief, Secretary

Equipment Developments

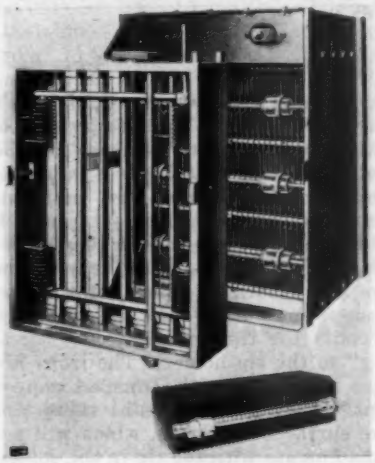
For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 114 and mail to us.

△ Indicates manufacturer not listed in 1946 Directory.
• Indicates product not listed in 1946 Directory.

23—Electro-Cell

American Air Filter Co., Inc., 125 Central Ave., Louisville 8, Ky., is now manufacturing the Electro-Cell, a unit type electronic air filter with removable collector plate assemblies.

The positive and negative collector plates are assembled on cross rods to form horizontal groups which are easy to handle and readily removed from the filter casing.



Sliding into the filter casing in much the same manner as a desk drawer, plate assemblies can be removed for cleaning and reoiling at convenient water and sewer connections. A spare set of plates, sufficient for one section for use as a replacement, reduces the length of time the filter is out of service to a minimum. An automatic washing device has been developed, permitting collector plate assemblies to be washed in place for installations where manual washing is not feasible.

Standard sections of the Electro-Cell are 2 and 3 ft. in width with a capacity of 1,000 cfm per unit and range from this minimum to as many sections as are needed for the particular installation. The construction of the filter is such that it eliminates the duplication of top and bottom sections of box-like units when assembled one upon another. This is accomplished by the manufacture of the filter in a variation of heights from a minimum of 27 in. to a maximum standard height of 15 ft. by 9 in. increments.

In the larger sizes of the Electro-Cell (6 ft. or higher), the ionizers are mounted on a bar hinge which swings clear of duct work or adjacent sections.

24—Eraydo Sheets

W. F. Potts, Son & Co., 1224 Cherry St., Philadelphia 7, is exclusive distributor for Eraydo sheets—commercially pure zinc alloyed with copper to give the required tensile strength and stiffness; in one standard size, 36x90 inches, and in three gauges (No. 8, equal to 28-gauge steel, No. 9, equal to 26-ga. steel and No. 11, equal to 24-ga. steel). The price is somewhere between galvanized steel and copper.

The company plans to produce conductor pipe and eaves trough.

The material is also available in continuous rolls, widths 4 to 16 inches, inclusive, and in No. 9 gauge, equivalent to 26-ga. steel, weighing two-thirds of a pound per square foot.

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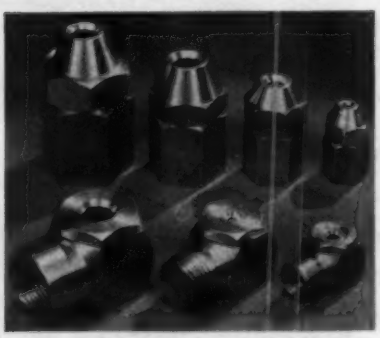
25—Nozzles

The Delavan Engineering Co., Des Moines, Iowa, is developing spray nozzles for water, oils and other liquids, for volume applications.

The row of nozzles in the back of the illustration shows types WS and WSS nozzles. Type WS produced a hollow cone spray and Type WSS a



full cone spray. They are offered with both female and male pipe threads in ¼, ⅜, ¾ and 1-inch sizes and for a range of capacities from 15 gpm to 24 gpm.

The nozzles shown in the foreground are type WR, now available in ¼, ⅜ and ¾-in. pipe sizes, both male and female threads, over the same range of sizes.

These two types of nozzles find many uses in air conditioning, air washing, humidifying, room cooling, industrial and other applications.

• 26—Wall Cutter

Minneapolis-Honeywell Regulator Co., 2753 Fourth Avenue, South, Minneapolis 8, offers a newly developed machine, looking like a buzz saw attached to the end of a vacuum cleaner hose, capable of cutting precise channels in plaster walls for heating controls installed in each apartment—a

thermostat individual apartment control system. The machine cuts a groove in the wall and absorbs all dust through a vacuum attachment.

The necessary copper tubing for the control can be buried inside a wall, so that with the use of a specialized plastic and masking tape, the finished job as unnoticeable.

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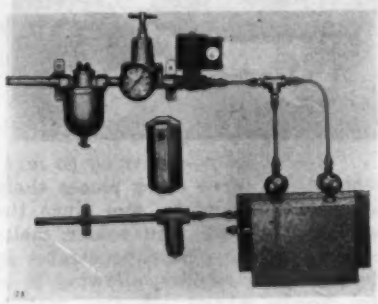
•27—Industrial Humidifier

Spraying Systems Company, 4021-F W. Lake St., Chicago 24, has produced a new low-cost industrial humidifying



unit. The unit is delivered ready for installation. It produces a finely atomized humidifying spray.

This unit is made with two or four nozzles with humidistat control.

Equipment Developments.

For your convenience in obtaining information regarding these items use the coupon on page 114.

• 28—Model 1100 Humidifier

Viking Air Conditioning Corporation, 5600 Walworth Ave., Cleveland 2, has designed the Model 1100 humidifier.

The narrow evaporator pan, made of copper, goes inside the bonnet or plenum. The water supply is maintained at a constant level by the float tank which is mounted outside of the

furnace. The outside float tank is also made of copper, finished in color with a contrasting trim. The water level is maintained constant automatically with the Viking top seat float valve located in the float tank.

High rates of evaporation are possible by the use of glass mat evaporators which draw water from the pan by capillary action.

The humidifier package is complete with instructions and all fittings necessary to install in either a straight side plenum or the sloping bonnet of a gravity furnace.

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29—Tri-Core Solder

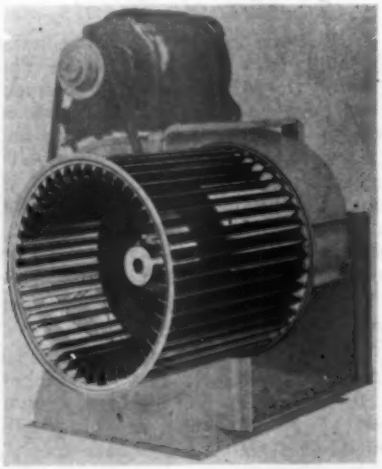
Alpha Metals, Inc., Solder Development Division, 369 Hudson Ave., Brooklyn 1, N. Y., has developed Tri-Core, a solder with three independently filled cores of pure rosin flux. The three cores are completely independent of each other. The arrange-

ment of the three cores places them closer to the surface, and since the walls are thinner, the solder melts more quickly and heat penetrates to the flux more rapidly, allowing it to flow freely ahead of the molten solder.

Tri-Core solder exceeds ASTM Class A specifications and is available in all alloys, all flux percentages and all gauges.

30—Series "A" Wheel

The Lau Blower Company, Dayton, Ohio, announces the details of a new blower wheel which the company will turn out in quantity at low unit cost. The new blower wheel will be identified as the Lau Series "A."

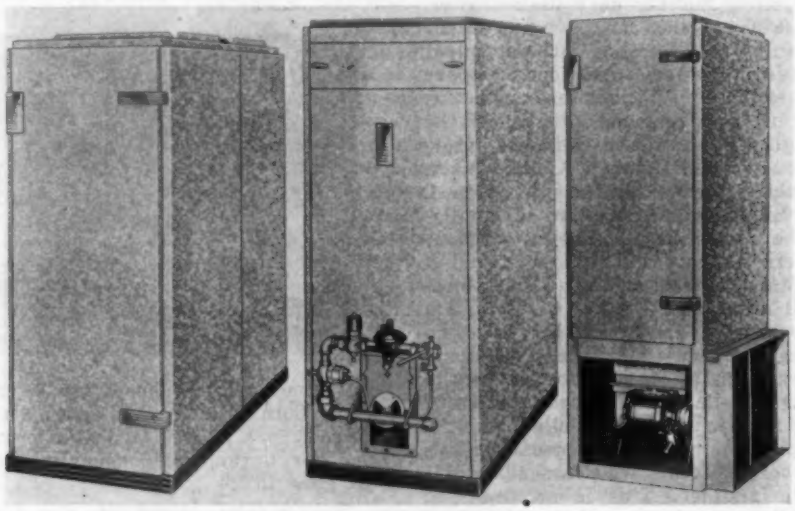


The new Lau Series "A" blower wheel is a center suspension wheel with greater mechanical strength, truer concentricity and balance, and more efficient performance. It has deep blades proportioned for maximum efficiency, and each blade is a driven blade mechanically locked to the center disc. The end ring is narrower than end rings can be for rivited or welded construction.

• 32—Soldering Irons

General Electric, Industrial Heating Division, announces a new and improved line of industrial soldering irons. Ranging from 75 to 300 watts in size and available with tips from ⅜ to 1¼ inches in diameter, the new irons are designed primarily for severe and exacting soldering operations in industrial plants where fast, continuous, high quality soldering is required. They are also suitable for light, medium, and heavy intermittent soldering.

A feature of these irons is their quick recovery and high reserve-heat capacity, which permit soldering as fast and continuously as the character of the work allows. Another feature is the use in these irons of calorized (surface-alloyed with aluminum) copper and 18-8 stainless steel for all parts subjected to high temperatures. This, together with the use of the Calrod heating unit, assures long life, uniform performance, low maintenance, and allows convenient renewal. The heating units can be easily replaced. The chisel-shaped copper tips are also calorized, which retards corrosion, facilitates easy renewal, and permits the tip threads from "freezing" to the tip holders. The irons are also furnished with Ironclad copper tips. The working ends of these tips are surfaced with iron, which will not amalgamate with the tip in the solder.



31—Moncrief Gas-Fired Furnaces

The Henry Furnace Company, Medina, Ohio, has completely redesigned the Moncrief gas-fired air conditioning units and gravity furnaces. These units have passed the rigid, 1947 requirements set up by the American Gas Association.

Enclosed in the new cabinet are many advanced engineering features, new in gas-fired heating equipment, which permit easier installation and easier servicing, as well as greater operating efficiency.

Norge-Heat KEEPS THIS PLEDGE TO YOU . . .

This pledge was made to you in 1942:

"We know that our policy of dealing only through the established heating trade is sound. That is our policy now and it will be our policy when this emergency is over."

Now, as we re-enter the period of manufacturing consumer goods, we re-affirm this policy of dealing only through the established heating trade. We will make the finest quality products and will give you the sales-making cooperation necessary to enable you to make the maximum profits throughout the years ahead.

J. W. "Bill" Oswald

Sales Manager
Norge-Heat Division, Borg-Warner Corporation

NORGE-HEAT ANNOUNCES NEW FULL LINE

of "Better Products for Better Living"

A complete line is now prepared for those of you who want to earn more profits—now and in the years to come. For over 20 years Norge products have been building a reputation for economy, for efficiency, for satisfaction. At the same time, millions of dollars have been spent in advertising to make the name Norge respected in every American home . . . and to build prestige for Norge dealers.

Today's complete line of Norge-Heat units – including blower filter units, conversion oil burners and coal-burning furnaces—offers sales advantages combined in no other line! And the friendly *personal service* of the Norge-Heat folks makes this line a pleasure for you to handle.

As a dealer for Norge-Heat you will profit from the resources of the Borg-Warner Corporation—its many engineering skills . . . its highly developed manufacturing techniques . . . its facilities for quantity production . . . its wide experience and knowledge of what your customers will buy.

One of the immediate advantages you will experience from having such a connection is the speedy production and quick delivery of better products . . . products which will enable you to compete in price with ordinary models and still make full profit.

Such advantages make a Norge-Heat franchise the great value it is. We invite you to write us—now!

Norge-Heat

Norge-Heat Division, Borg-Warner Corporation
670 East Woodbridge Street Detroit 26, Michigan

CONTROLLED COMBUSTION

ENGINEERING B-W PRODUCTION

SEE NORGE BEFORE YOU BUY

EARLY DELIVERY FORECAST FOR THESE

NEW UNITS OF COMPLETE Norge-Heat LIN

"FAMOUS MEMBERS OF A FAMOUS FAMILY"

Model 120B Oil-Burning Winter Air Conditioner—with NORGE-HEAT VACUUM-DRAFT PRINCIPLE—EXCLUSIVE IN THE DOMESTIC FIELD—OFFERED EXCLUSIVELY THROUGH THE ESTABLISHED HEATING TRADE

This Model 120B is the sensation of 1946—with engineers, the heating trade and customers alike! It has already been proved for *four* years in 3500 homes. Today we have files filled with *unsolicited* testimonials.

120,000 B.T.U. BONNET OUTPUT—Fully automatic, atomizing type, oil-burning unit. 1200 C.F.M.; automatic draft by vacuum-draft principle; two 16x25" filters; centralized, visible servicing; low operating cost; quick, low-cost installation; factory-wired; factory-tested; automatic humidifier; horizontal fire tunnel; spiral "ramp" economizer; electric ignition; basement or utility room installation; meets code regulations.

Norge-Heat

Norge-Heat Division, Borg-Warner Corporation
670 East Woodbridge Street Detroit 26, Michigan

CONTROLLED COMBUSTION

Send now for free detailed information on these units—and the complete new Norge-Heat line, including coal-burning furnaces in 22", 24" and 27" grate sizes

Norge-Heat OIL-BURNING WINTER AIR CONDITIONER Model 90B

90,000 B.T.U. BONNET OUTPUT—Fully automatic, pressure atomizing type unit. 950 C.F.M.; automatic draft by vacuum-draft principle; one 20" filter, single-power unit; centralized, visible servicing, low operating cost; quick, low-cost installation; factory-wired; automatic humidifier; horizontal firing tunnel; spiral "ramp" economizer; electric ignition; meets government code regulation CS-75-39.

Norge-Heat OIL-BURNING WINTER AIR CONDITIONER Model 80B

80,000 B.T.U. BONNET OUTPUT—New fully atomizing type, oil-fired gravity warm air furnace for installations requiring slightly larger capacity than the average small home. The ideal unit to replace coal-fired warm air furnaces. Automatic draft by vacuum-draft principle. Norge-Heat blower filter units for converting these models into winter air conditioning systems are available at low cost.

Norge-Heat OIL-BURNING FURNACE Model 70B

70,000 B.T.U. BONNET OUTPUT—Modern, vertical pressure-vaporizing unit. 500-900 C.F.M. Only 26 inches square; can be installed two inches from wall on either side. Converts to winter air conditioner by adding filters and humidifier. Automatic draft supplied by two-stage fan; low-voltage thermostat; combination fan and limit control; safety float valve; fast, low-cost installation; factory-wired; all controls fully automatic; meets code regulations.

Norge-Heat OIL-BURNING FLOOR FURNACE Model 50B

50,000 B.T.U. BONNET OUTPUT—Modern "under-floor" vaporizing unit; needs no furnace room. Extends down only 36 inches; controlled from the room above through floor grille. Low first-cost (about the same as a space heater); no duct work or pipes. Economical. A Norge "package," comes ready to install. Small grille area; easily removable for servicing. More heating surface. Thermostatic control optional.

Norge-Heat OIL-BURNING HOT WATER HEATERS

Automatic water heaters for basement, kitchen, utility room; fully insulated; 30 to 40 gallons per hour recovery; automatic draft regulator; better economy with new Norge Scotch pilot.

Model WO 20B: 20 gallons; WO 30B: 30 gallons; WO 50B: 50 gallons.

ENGINEERING B-W PRODUCTION

SEE NORGE BEFORE YOU BUY

"He's looking for trouble"

His trained eyes spot immediately any imperfection . . . even the slightest deviation from PENN'S high standards. For, like the many other PENN experts in quality control and inspection, he is hired to find fault . . . to eliminate any future trouble spots in the PENN Controls you purchase. As a result PENN Controls are *the best that can be built* . . . the kind of product you can handle with confidence and profit.

The dependability and efficiency of PENN Controls, assured by this inspection and quality control, win you better satisfied customers. You can rest assured that PENN inspectors and engineers are extremely critical. There is no compromise. Every PENN product must pass rigid specifications. Here, for instance, this inspector employing a visual gauge, checks carefully the critical dimensions of a screw machine part used in PENN Controls.

And so it goes throughout PENN'S modern factory. Care in design! Care in manufacture! Care in inspection! All aimed toward a single objective—*better automatic heating controls for you!* In PENN'S complete line you'll find a control for every type of heating job . . . every type of heating system. See your local jobber. *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ont.

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

How We Profit with Arc Welding

by FRED COX, PROP.
F. H. COX COMPANY,
GRAND RAPIDS, MICH.

Because arc welding simplifies the design and fabrication of items using sheet metal, plate, structural members and pipe, we have been able to branch out into new lines and build a wide variety of products at unusually low cost. Much of our growth during the past 10 years has been due to this flexibility. Here are a few examples:

Fig. 1. Fabricating conveyor link. Lincoln "Shield-Arc Jr." Welder is shown in background.

Fig. 1 shows one of our welders, Claude Van Kuiken, fabricating a link in a portable conveyor unit. Side members are 10 gauge pressed steel, formed into channels with ½" tubing cross members. Tack welded in jigs, then finish welded to side members. Our customer finds this link extremely strong, rigid and light.

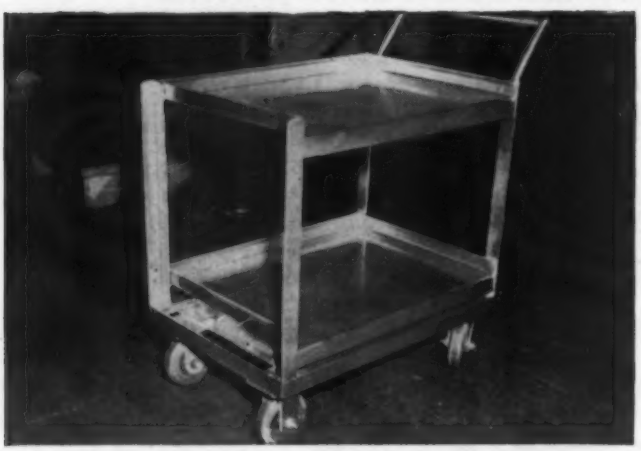


Fig. 2. Restaurant buggy of rigid welded construction.

The restaurant buggy, shown in Fig. 2, is made from 1½" x 1½" angles and ⅛" plate. Casters are welded to bottom of angle iron frame. Handle is welded from 3 pieces of ⅝" pipe and with a bend of 30° on side members. Then we weld it to the inside of the rear angle uprights. These are very popular.

Fig. 3. Bakery pan holders.

Bases of the cake pan holders shown in Fig. 3 are made from 14 gauge sheet, bent in a brake. Corners are welded with ⅛" "Fleetweld 7". Tubular members are 1" pipe welded to the inclined platform, providing a very rigid structure. These holders can take a lot of banging around.

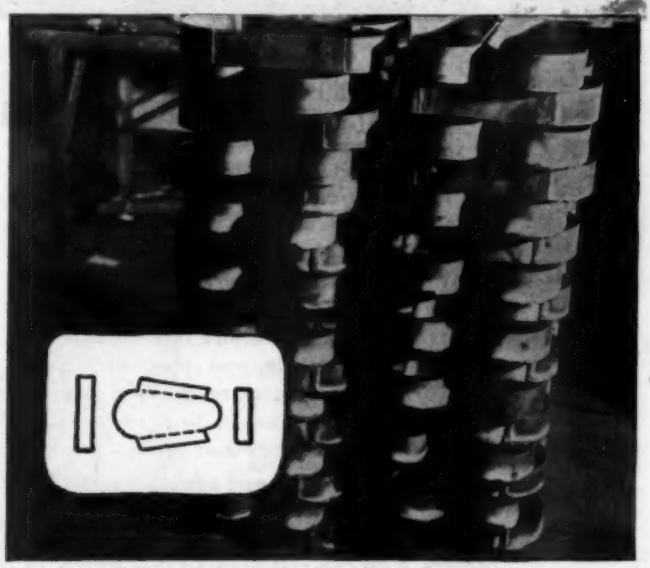
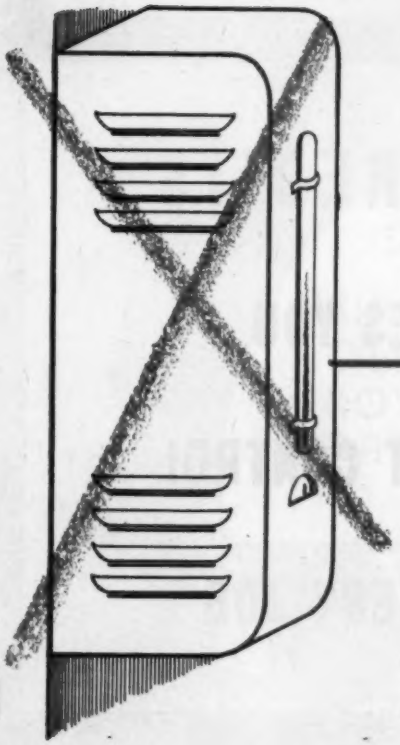


Fig. 4. Gear guards. Sketch shows layout.

We fabricate the special gear guards shown in Fig. 4 from 10 gauge black iron, stamping out the sheet (see insert) so that we need only two butt welds and a corner weld at each end—welded with ⅛" "Fleetweld 7". A little grinding takes off the excess weld metal. Subcontracting of machine parts such as this has increased our business considerably.

★ ★ ★

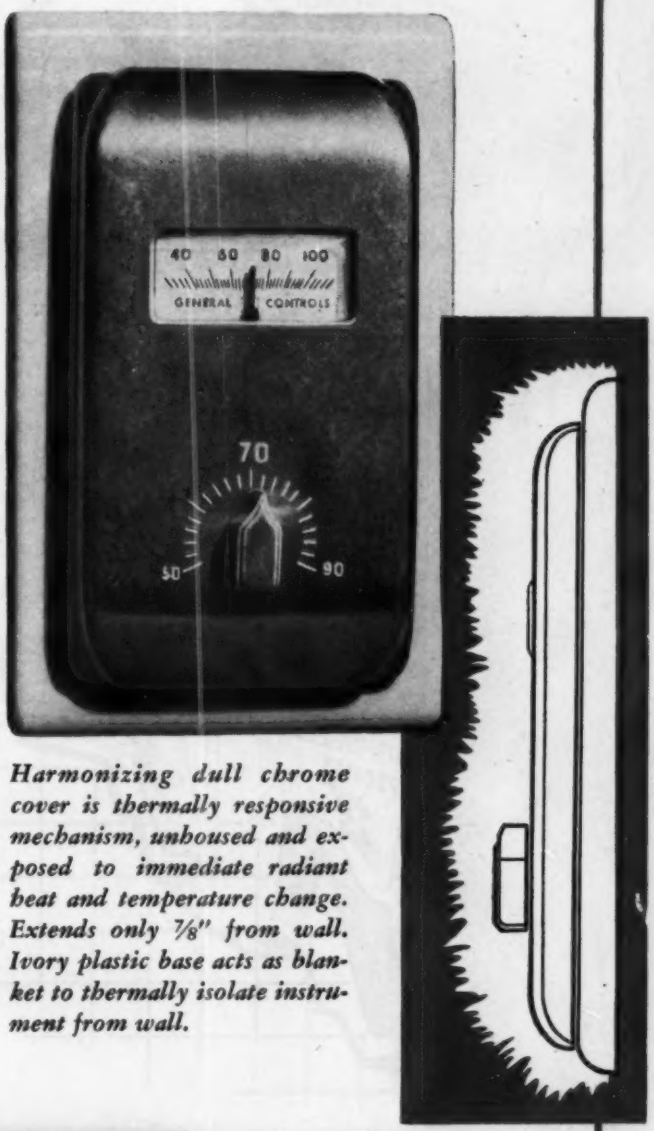
Link-up with LINCOLNEERING for sheet metal profits. Call the nearest Lincoln office for Lincolneering Service. Sheet metal welding procedures free on request. Write for Bul. 444. THE LINCOLN ELECTRIC COMPANY, Dept. 451, Cleveland 1, Ohio.



Functional beauty....

TRIMTHERM

Accurate Room Temperature Control



Harmonizing dull chrome cover is thermally responsive mechanism, unhoused and exposed to immediate radiant heat and temperature change. Extends only 7/8" from wall. Ivory plastic base acts as blanket to thermally isolate instrument from wall.

GENERAL CONTROLS' T-80 Series Trimtherm has set a new standard of accuracy in remote control of room temperatures. Its remarkable sensitivity insures a differential of only ½°F. Its dull chrome cover, streamlined design and flush mounting harmonize with any scheme of room decoration. The Trimtherm is truly an example of functional beauty.

Compare the conventional type thermostat above, where air has to pass through louvers in the housing to reach the sensitive element, with the compact Trimtherm at right, which typifies the ultimate in modern engineering design. A thermostat that lives thermally in the room.

T-80 Series Trimtherm available only in B-60 All-Gas-Control Package Sets. Sets include a B-60 Series Gas Control Valve, Thermocouple Pilot Generator (no outside current required), 30 feet of thermostatic wire and a T-80 Series Trimtherm.

FOR COMPLETE SPECIFICATIONS on temperature, pressure and flow controls for commercial and domestic applications in the Gas Industry, write for Catalog 52-B and Service Manual F1-101, or contact your nearest Factory Branch or Distributor.

GENERAL CONTROLS

801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

ALLIED BUILDING CREDITS

GIVES YOU

PERFECT CONTROL

OF EVERY JOB

Pull Sales and Profits Up by Selling the ABC Way

Profits follow sales and sales skyrocket when you "make it easy to buy" with ABC time payment selling. You can sell your ABC customer more material or a bigger job. To him, the difference between, say, $9.58 and $15.97 a month is not great, but on a three year payment plan your sale has increased $200. Multiply that amount a few times and watch your sales and profits soar.

You can control the entire sale because you make arrangements for credit right in your own place of business. The customer does not "go out and get a loan" and then become a price shopper. Another ABC advantage: you get paid in cash, tie up no capital in charge accounts, and avoid collection headaches.

For complete information on how the ABC budget payment plan will increase your sales, write Allied Building Credits, Inc., 2504 First National Bank Building, St. Paul 1, Minnesota.

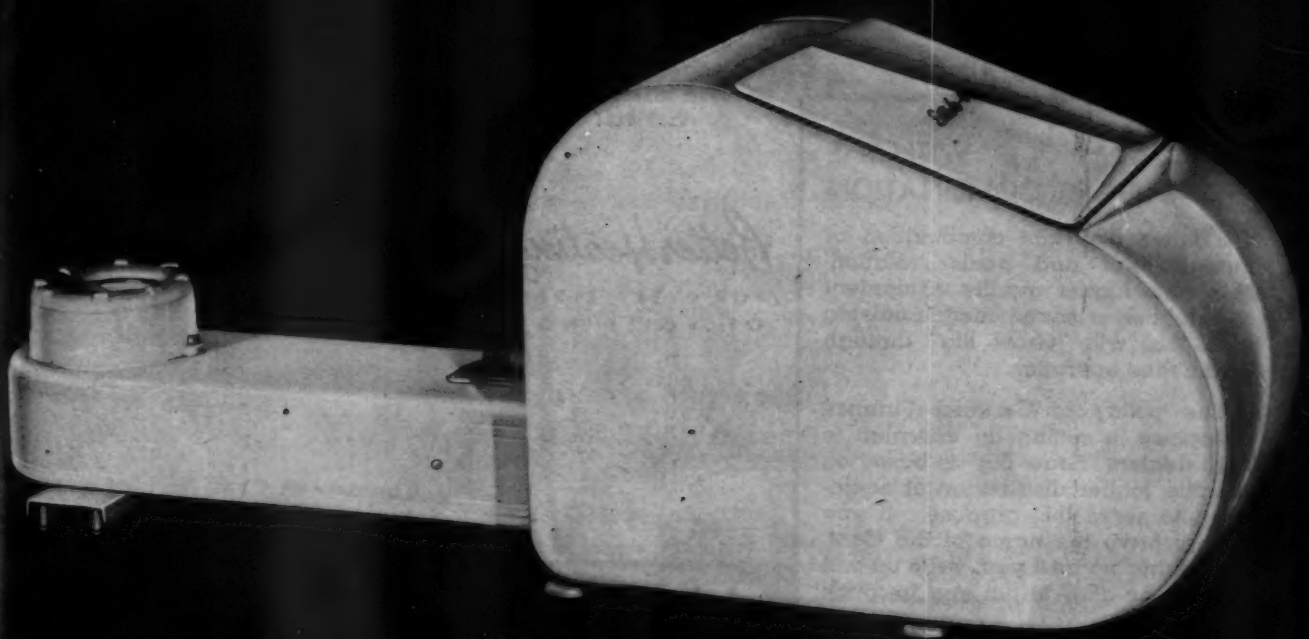
ALLIED BUILDING CREDITS, INC.

FIRST NATIONAL BANK BLDG. ABC SAINT PAUL 1, MINNESOTA

Complete Installment Note and Mortgage Services for the Building Industry

"KING COAL" IS A MERRY OLD SOUL—AFTER THE ROYAL WELCOME AND NATION WIDE ACCLAIM *given the*

WHITE *Stok-A-Fire*



Stok-A-Fire Co. 6504 OLIVE BLVD. — ST. LOUIS 5, MO.

THE LINE THAT MEANS

Dependable Service

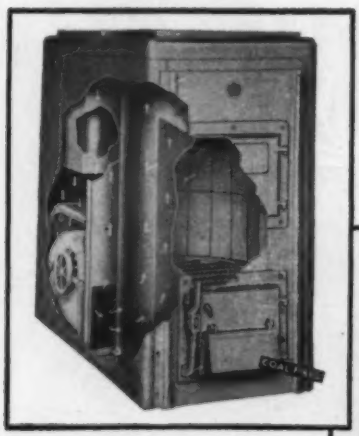
AND

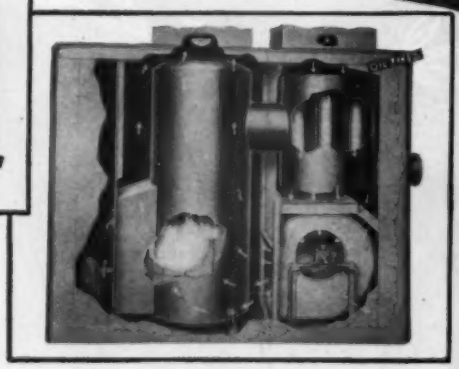
SATISFIED CUSTOMERS

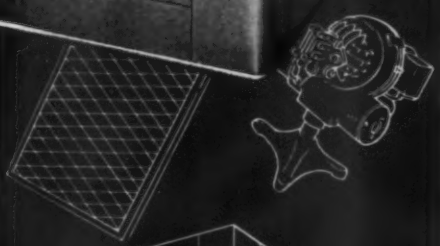
Certified

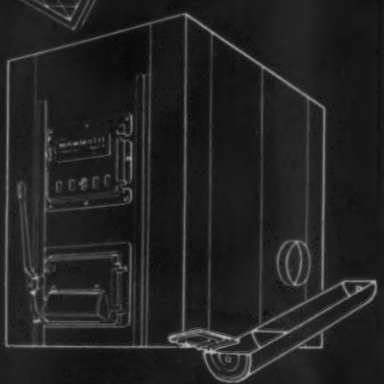
COUNTERFLOW AIR CONDITIONER

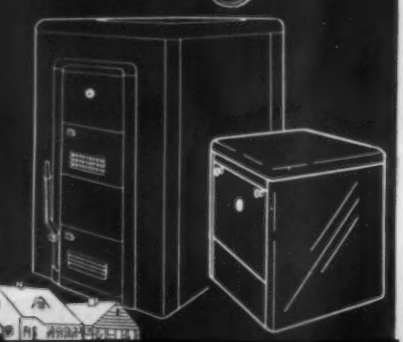
This attractive air-conditioning unit for oil, gas, stoker or hand firing is built in nine sizes and fully equipped for immediate installation. Here is a double body furnace, complete in one casing, providing longer fire travel and greater heat absorption surface for less heating cost and complete heating comfort.











"Grow Big"

WITH THE RIGHT COMBINATION

It takes the right combination of manufacturer and dealer relationship plus higher quality equipment to establish a sound merchandising plan that will "Grow Big" through continuous operation.

The policy of Certified Furnace Company in setting up this plan to help dealers "Grow Big" is based on reliable jobber distribution of equipment to serve this purpose. If you do not have the name of the Certified jobber nearest you, write us and we will be glad to put you in touch with them.

FOR FURTHER INFORMATION SEE YOUR JOBBER OR WRITE US DIRECT

Better Heating FOR EVERY TYPE OF BUILDING

CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE. ST. PAUL 4, MINN.

"Every time he sees a crowd... he goes into his act!"

You can't blame a wide-awake distributor for being enthusiastic ... once he's seen the picture of the new 1946 Fairbanks-Morse Stoker.

Fairbanks, Morse & Co.
Fairbanks-Morse Bldg., Chicago 5, Illinois

FAIRBANKS-MORSE

A name worth remembering

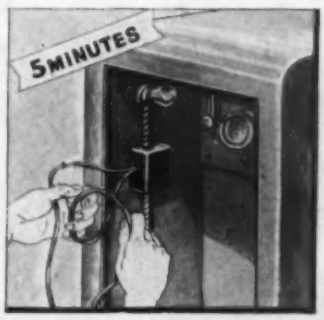
DIESEL LOCOMOTIVES • DIESEL ENGINES • MAGNETOS • GENERATORS • MOTORS • PUMPS
SCALES • STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT

Sometimes Its Good Business to . . .

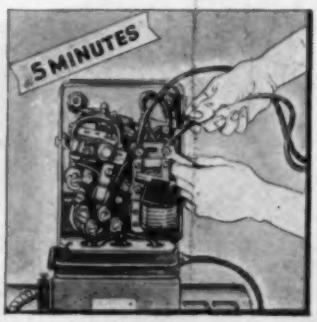
"Watch the Clock!"

Cut Installation Time with PACKAGED HEAT

1. Connect existing oil line to unit in 20 minutes.



2. Run existing 110-volt line into knockout box and connect in 5 minutes. No further wiring required.



3. Connect thermostat wires in 5 minutes after they have been run to burner.

4. Connection of boiler (complete) to existing radiation headers and existing piping in 4 hours.

Penn Packaged Heat is available in both oil and gas units for homes of all sizes.

PACKAGED HEAT—*as packaged by Penn*—includes dealer-profit protection in the "package" . . . and any watch or clock will prove it! Absolutely complete connection of Packaged Heat to existing facilities requires a few hours only. Even the standard controls are delivered mounted on the unit and enclosed in the jacket—an advantage due to Penn's exclusive, *patented* "Wing Jacket" construction. Oil in-put is fixed at the factory. With Packaged Heat your installer "just picks it up . . . sets it down . . . and plugs it in."

PENN BOILER & BURNER MANUFACTURING CORPORATION

LANCASTER, PENNSYLVANIA

Extra Copper Plus Molybdenum Makes Toncan Iron

Resist Rust

To assure long life for sheet metal products, you must protect them from rust. And the best way to do that is to use Toncan Iron. This material is especially designed to offer stubborn resistance to even the most severe conditions of rust.

Extra copper plus molybdenum added to highly refined open-hearth iron is the secret of Toncan Iron's rust-resistance. It contains twice as much copper as copper-bearing steel. The molybdenum refines the grain structure and forces the copper to increase its effectiveness against rust. The result is Toncan Iron—with the highest rust-resistance of any ferrous material in its price class.

Toncan Iron also has high ductility. This makes it easy to cold work, cut, bend, punch, stamp, etc. And fabrication will not destroy the protection offered by Toncan Iron, because it is rust-resistant throughout its entire cross section.

Assure long life and fast fabrication of sheet metal parts by making them from Toncan Iron.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Your customers will like the economy offered by Toncan Iron parts—you will like the profit opportunities it offers. For details, write for booklet 410, "How Toncan Iron Makes Money for Sheet Metal Contractors."

Republic
TONCAN COPPER MOLYBDENUM IRON
Reg. U. S. Pat. Off.
—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance.

For Dependable Humidification

Positive Action
Throttle type action maintains the proper water level at all times... no complicated high and low level actuating points.
For occasional servicing or cleaning the brass wing nut can be loosened and the whole assembly exposed.
Disengage the brass cotter key and the complete float assembly can be removed for inspection or cleaning.

Here is the humidifier you've been waiting for. Simple and easy to install and designed to operate for years with little or no attention.

Exhaustive study and research under actual operating conditions has dictated the need for a simple, easy to clean valve and an acid resisting water supply tank. Viking has the solution.

THE VALVE

Made entirely of brass and located above the water level in the supply tank. Simple rocker action... no springs no sliding parts.

THE TANK

Deep drawn from 24 oz. copper in a single piece... no seams... no welds. Located outside the bonnet or plenum... readily accessible for occasional inspection or cleaning.

WRITE TODAY

...get complete information and specifications on a dependable humidifier.

Viking ARMY NAVY FOR EXCELLENCE

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 114

134—Through Wall Flashing Copper

Copper & Brass Research Association, 420 Lexington Avenue, New York 17, is distributing a monograph on copper for "Through-Wall Flashing" which is number five of a series to architects and sheet metal contractors.

Various types of through-wall flashing are illustrated, as well as pent-house wall and door; spandrels, cornices and copings; window lintels and sills; belt courses and chimney flashing.

◆

135—Steel in the War

United States Steel Corporation, 71 Broadway, New York 6, N. Y., has published "Steel in the War"—168 pages with cover—recording some of the industrial feats performed by United States Steel Corporation and the steel industry, operating under the American system of free private enterprise in the greatest war of all time—a war fought with weapons and equipment made largely of steel.

Chapters cover: The Sinews of War; Steel for a New Kind of War; Steel for Ships; Steel for Guns, Bombs and Shells; Steel for Planes; Steel for Tanks; Steel for Transportation and Supply; Coal Chemicals Aided War Effort; Steel for Our Allies; Steel for the Home Front; Brains and Skills of U. S. Steel Served Nation; In Peacetime—Better Steels for a Better America; followed by Statistical Summary. Two pages are devoted to an index of the contents.

◆

136—Copper Alloy Welding Handbook

C. E. Phillips & Co., 2750 Poplar Street, Detroit 8, has just published "Welding and Brazing of Copper and Copper Alloys"—a 32-page handbook of procedures and materials.

There are three principal divisions. In the introductory section important definitions of materials and processes are given, accompanied by a table of compositions and properties of the most commonly welded and brazed commercial copper alloys. This is followed by general information as to the welding characteristics of these materials, suggestions for preparing parts for welding, design of joints and the use of jigs and fixtures. A chart is included which indicates that each of the common copper alloy groups can be welded or brazed by several different methods and tells the preferred materials to be used with each method.

In the second section of the book each of the common copper alloys is discussed individually. Information is given as to composition, physical properties, forms usually supplied, suitability for hot and cold working and special welding characteristics. Then the applicability of each of the welding and brazing processes to the alloy is explained, a recommendation is made as to the preferred method to use for joining the alloy, the correct welding or brazing material is indicated, and tables of welding procedure are given for the processes that are recommended. The metallurgical nature of typical welded and brazed joints is illustrated by micrographs and photomicrographs. The text does not attempt to establish any one process as preferable for all copper alloys but rather makes it a point to study each alloy separately and select the process which promises best results.

A third and final section is devoted to welding and brazing materials for copper and copper alloys, and the general plan of treating each material separately is followed. Information supplied includes composition, characteristics, properties of deposit, purposes for which used, application procedures, recommended uses, standard sizes, lengths and packaging.

IRIS SHUTTER

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America's Most Complete Line of
DOMESTIC—COMMERCIAL—INDUSTRIAL
OIL-FIRED EQUIPMENT

More than eight-hundred square feet of exhibit space

Featuring the
"IRIS SHUTTER"—"FLAME FORMER"—"AUTOMATIC TORCH LIGHTER" and other important technical advances that make YORK-HEAT the most desirable franchise in the industry.

YORK YORK-HEAT

See..
YORK-HEAT
with the
IRIS SHUTTER
★ Compare—its performance
★ Compare—its features
★ Compare—its construction
★ See—a demonstration of the Iris Shutter
LEAVE IT TO A PIONEER IN OIL BURNER DESIGN TO SHOW THE WAY!
YORK-HEAT has taken its traditionally fine equipment—so well known for its satisfactory service—and has stepped it ahead in design and engineering detail. YORK-HEAT is now the modern version of heating perfection—with the automatic features you have always wanted for greater comfort and convenience.
Only YORK-HEAT Has The IRIS SHUTTER
This "Camera Eye For Heat" is just one of the many outstanding features in YORK-HEAT. Watch it operate in your dealer's showroom! See how it regulates and controls the flow of air to the Burner and helps create efficient, trouble-free operation. You'll quickly see, too, why YORK-HEAT is so often the architect's choice for modern oil heating! ★★★ Models, sizes, and types of YORK-HEAT are available for every heating requirement.
Write for attractive illustrated folder and the name of your nearest YORK-HEAT dealer.
YORK-HEAT
Address: YORK-HEAT Division of YORK-SHIPLEY, Inc. YORK 2, PENNSYLVANIA
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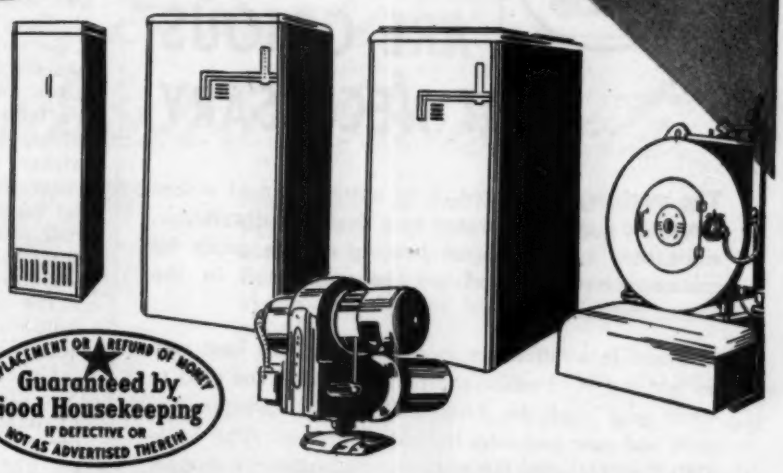

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Guaranteed by Good Housekeeping
IF DEFECTIVE OR NOT AS ADVERTISED THEREIN

YORK-HEAT

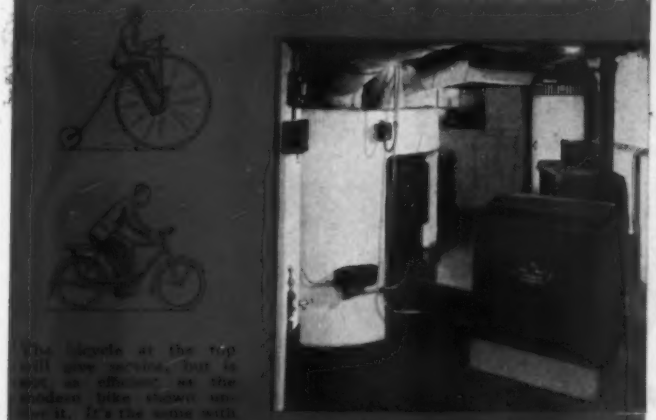
SUPPORTED BY LOCAL AND NATIONAL ADVERTISING

YORK-HEAT DIVISION of YORK-SHIPLEY, INC., YORK, PENNA.

Member of Oil Heat Institute of America

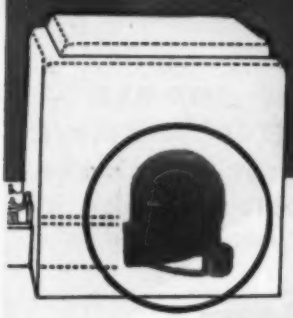
IF YOU START WITH QUALITY YOU'LL STAY WITH QUALITY

EASIER SELLING . . LESS SERVICE . .
LONGER LIFE . . SATISFIED CUSTOMERS
through
MECHANICAL SUPERIORITY



The bicycle at the top will give service, but is not as efficient as the modern bike shown under it. It's the same with modern mechanical superiority—easier selling and greater consumer satisfaction.

Automatic air control is as necessary to a stoker fire as a governor is to a steam engine. The exclusive Link-Belt AIR METER automatically keeps the fuel bed at the right depth for the highest efficiency of combustion.



Comparisons
ARE ODIOUS
....BUT NECESSARY

The mechanical features of an automatic coal stoker can make a great difference to a dealer or distributor, since they have a direct bearing on the profit he makes per dollar and per hour invested in the stoker business.

There *is* a difference in stokers, and the best way to find out is to make comparisons. We'll be glad to show you what the Link-Belt Stokers have on the ball, and how and why they are different. The Link-Belt line includes bituminous and anthracite hopper and bin-fed domestic models, and commercial and industrial stokers up to 1200 lbs. per hour coal feed capacity. Write for our proposition:

LINK-BELT COMPANY 10,287
Stoker Division
2410 W. 18th St. Chicago 8, Illinois

LINK-BELT Magic Flame and Power-Flex STOKERS

New Literature

For your convenience in obtaining copies of New Literature use the coupon on this page.

137—Fitrite Snow Guards

David Levow, 308 W. 20th Street, New York 11, N. Y., is distributing a 4-page catalog reprint showing their Fitrite snow guards, roof strainers, hinged leader bands, and ornamental copper and zinc straps.

◆

138—Insulation Application Data File

Kimberly-Clark Corporation, Neenah, Wisconsin, is distributing Kimsul Insulation Application Data File 37B—How to Measure and Cut Kimsul; Where to Install; How to Insulate Side Walls, Ceilings, Rafter Sections, Floors, Attics; Ventilation; Stapling and Nailing.

◆

139—Industrial Equipment and Supplies

Precision Equipment Co., 32 N. State St., Chicago 2, is distributing their 36-page Spring-Summer, 1946, catalog to factory superintendents, maintenance engineers, purchasing agents, and other plant executives interested in industrial equipment and supplies.

Listed is a complete line of mill supplies, as well as fans, steel shelving, lockers, electric tools, filing cabinets, a slide rule accurate to five places, etc.

◆

140—Copper and Common Sense

Revere Copper and Brass, Incorporated, 230 Park Avenue, New York 17, N. Y., has published a 96-page and cover book entitled "Copper and Common Sense—Research Solves Problem of Stress Failures in Sheet Copper Construction, based upon investigations by I. E. Anderson, Research and Development Department, and Walter C. Voss, Consultant."

So well had copper performed on buildings erected many years ago that there has grown among architects, engineers and builders a belief that a copper covering, no matter how thin, should stand up without harm from the effects of the hot sun of summer, the snow and cold of winter, provided it is properly installed. Yet, in recent years, failures have been reported of copper sheet used for gutters, flashings and roofs. Revere now reports the real cause of such failures, following a comprehensive study of copper construction failures made in the Research Laboratories in Rome, N. Y.

The book contains the story of an adventure in research—how stress failures occur, the proposed solution, and details of sheet copper installations.

General Specification No. 100—June 1, 1945—A.I.A. File No. 12—Copper Roofing and Sheet Metal Work—is also available.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

23	24	25	26	27	28
29	30	31	32		
134	135	136	137	138	139
140					

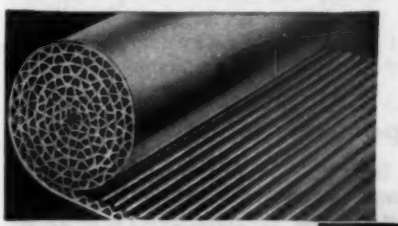
Name .....
Company .....
Address .....
Are you Manufacturer——Jobber——Dealer——

★

Sheet metal men everywhere are turning out accurate work quickly and easily with Niagara machines and tools for shearing, blanking and forming sheet metal.

NIAGARA

MACHINE & TOOL WORKS
BUFFALO 11, N. Y.
District Offices:
Detroit, Cleveland, New York

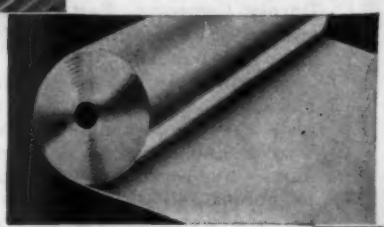


Quality Asbestos Products

Experience of more than 50 years in developing and manufacturing Asbestos Products places Sall Mountain Company in a leading position for all kinds of asbestos insulation and fireproofing.

SAL-MO ASBESTOS AIRCELL PAPER

For insulating hot air pipe, gas ovens, range boilers and other surfaces exposed to heat. Protects surfaces from rust and corrosion.



SAL-MO ASBESTOS PAPERS

Made in smooth, strong white sheets from the best grades of selected asbestos fibre. Specially processed to insure efficient insulation. In all standard weights and widths.

SAL-MO No. 77 ASBESTOS DUCTBOARD

An Asbestos Product for constructing ducts in warm air heating, ventilating and air conditioning systems. Made of solid Asbestos. Light in weight; fireproof and moisture proof. Easily handled and applied. 33x48 sheets.

SALL MOUNTAIN COMPANY
Asbestos
UTILITY SERVICE ECONOMY

TANK JACKETS
PIPE COVERINGS
CEMENT AND
OTHER ASBESTOS
PRODUCTS

SAL-MO ASBESTOS MILLBOARD

Fire and vermin proof, Sal-Mo Asbestos Millboard is not affected by age or dampness. For insulating stoves, ovens, electrical and heating appliances, protecting walls from heating apparatus. Standard size sheets; also cut to size.

SALL MOUNTAIN COMPANY • ANDOVER 2414 • 176 W. ADAMS ST., CHICAGO 3, ILL.

H&C No. 130 Baseboard Register

Deliveries are Expedited

When you stick to the sizes called for by the Register Standardization Program of the National Warm Air Heating and Air Conditioning Association. Service on these sizes will be better than on non-standard sizes. Hence you will greatly help yourself in getting the registers you need, by cooperating with your jobber in ordering only the standardized sizes. These standard sizes are clearly indicated for all lines in our new No. 46 Catalog showing our streamlined line of registers and furnace accessories. Ask your jobber for a copy, or write us if you do not have one.

The standardized sizes for the finest of all Baseboard Registers, the H&C No. 130, are as follows:

No. 132¼—10 x 8 for 8" Pipe
No. 132¼—12 x 8 for 9" Pipe
No. 133¼—12 x 9 for 10" Pipe
No. 135⅞—13 x 11 for 12" Pipe

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

With the Manufacturers

Bryant Distributors Meet

Bryant Heater Company, 17825 St. Clair Ave., Cleveland 10, entertained wholesalers from 28 states at a three-day meeting in Cleveland recently. The company has acquired an additional factory in Cleveland, completed another in Tyler, Texas, and has a new laboratory in Mentor, Ohio.

◆

Lau Operating at Full Capacity

The Lau Blower Company, 2001 Home Avenue, Dayton 7, Ohio, reports both plants operating at full capacity, to the extent that they are able to secure steel, motors and other component parts. A short time ago their No. 2 plant did have a small flash fire that was quickly controlled, with no serious damage resulting.

◆

Detmers to Distribute Sheet Metal Products

Arthur C. Detmers, after fourteen years with the J. M. and L. A. Osborn Company of Buffalo, has resigned to establish his own company as a wholesale distributor of sheet metal products in Western and Central New York State, with offices at 1431 Genesee Street, Utica, N. Y., and at 64 Garrison Road, Williamsville, (Buffalo 21), N. Y.

◆

Kresky Expands Facilities

Kresky Manufacturing Company, Petaluma, California, manufacturers of Kresky oil burner equipment for home heating, ranges and light industrials, has recently completed extensive additions to their plant facilities more than doubling production capacity.

Even with the new plant additions, the company is unable at present to accept any orders from new accounts. Nevertheless, Kresky welcomes inquiries from the territories still not covered by Kresky franchises and is constantly lining up dealers for future operations.

◆

Announces Expansion—Changes Name

A new corporation known as Wayne Home Equipment Company, Inc., has been formed to succeed Wayne Oil Burner Company, Fort Wayne 4, Indiana. There is no change of ownership, but the scope of operation has been greatly expanded.

The company is a pioneer manufacturer of domestic oil burners and oil burning furnaces. Designing and field tests have been completed and production started on the Wayne line of home equipment which includes turbine pumps and water systems for shallow wells, centrifugal jet pumps and water systems for deep wells, water heaters and water softeners, in addition to the new Model "O" domestic oil burner and a new line of oil and gas-fired automatic furnace units.

A strict Wholesale-Dealer sales policy has been adopted and a number of wholesalers have received distributor franchises.

A marketing program, known as the "Wayne Wholesaler-Dealer Partnership Plan," has been set up around independent full-line wholesalers and dealers, and a thorough advertising and promotional program is provided to merchandise the complete line.—B. G. Duer, vice president in charge of sales.

◆

Lt. Commander Thompson Morrison, USNR, returns to Morrison Products, Inc. after a leave of absence of forty months, thirty-five months of which were spent at sea in convoy duty in the North Atlantic, and as commanding officer of an APL in the Pacific theater.

He will resume his duties as vice president and sales manager of Morrison Products, Inc., Cleveland 10.

Designed and built to assure dealer profits and customer satisfaction. Capacities: 4,000 CFM to 10,000 CFM. Deliveries now available.

ALTON MFG. CO
AIR-CHAMP
DALLAS

AIR-CHAMP EVAPORATIVE COOLERS

. . GIVE AUTUMN TEMPERATURES IN HOTTEST WEATHER AT LOWEST COST

YOUR customers can afford to buy and operate this modestly priced, efficient cooling unit. You'll appreciate the generous dealer turn-over margin. And it is a fast seller. The Air-Champ is smartly designed, beautifully finished for eye appeal, and fits conveniently into

RESTAURANTS ***STORES***
BEAUTY SALONS ***TAVERNS***
DRUG STORES ***NIGHT CLUBS***
BOWLING ALLEYS, Etc.

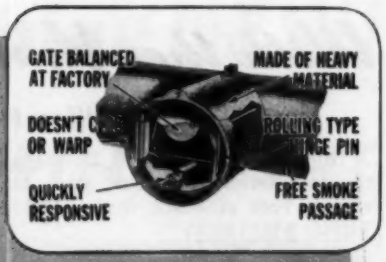
Air-Champ drops room temperatures 10 to 15 degrees below outside air readings. At the same time air is washed, filtered and correctly circulated. Cool your show room with a sample Air-Champ, and performance will make the sales for you.

Descriptive folder and price list mailed to dealers on request.

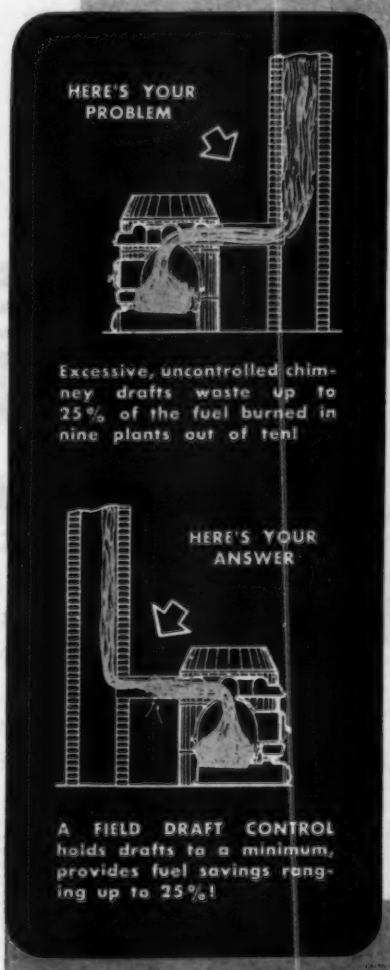
ALTON
MANUFACTURING COMPANY

1111 Camp Street • Dallas • Texas

THE *field* DRAFT CONTROL



CONTROLS THIS DRAFT TOO


HERE'S YOUR PROBLEM
Excessive, uncontrolled chimney drafts waste up to 25% of the fuel burned in nine plants out of ten!
HERE'S YOUR ANSWER
A FIELD DRAFT CONTROL holds drafts to a minimum, provides fuel savings ranging up to 25%!

● **When a heating plant performs BADLY, the owner SQUAWKS . . . . but LOUDLY! The product is 'lousy'; the dealer is a crook!" Yes, word-of-mouth *advertising* work *BOTH WAYS*. And the pity is that the *heating* plant may be a beautifully engineered job, lacking only proper draft control for perfect operation. Good, inexpensive, trouble-free insurance AGAINST this type of bad publicity is a FIELD BAROMETRIC DRAFT CONTROL on every installation. But be sure you install a FIELD. Remember this: Leading heating equipment manufacturers, with facilities to test and re-test every draft control made, have picked FIELD as standard equipment.**

FIELD CONTROL DIVISION

field

N. D. CONKEY & COMPANY • MENDOTA, ILLINOIS

With the Manufacturers

New Gillen Home

The J. L. Gillen Co., Dowagiac, Michigan, announces the completion of a new brick building comprising 2,800 square feet of office space, 13,200 square feet of warehouse space, a modern engineering and research laboratory and an attractive display room.

The company manufactures automatic oil-burning and electric water heaters and oil-burning furnaces.

Famous Furnace Banquet

The annual banquet of The Famous Furnace Co., of 6420 Woodland Avenue, Cleveland, manufacturers and jobbers of sheet metal, furnaces ,and roofing supplies, was held on Saturday, December 15th, 1945, in the Hollenden Hotel, Parlor B, in Cleveland.

For the 8th consecutive year, bonuses were distributed to the employees by President Hyman Blaushild. He once again remembered each of his former employees, still with the United States Armed Forces, with a bonus check.

The employees remembered Mr. Blaushild for his many kindnesses with a matched set of golf clubs and bag.

The company was happy to have this year some of the old employees that had been honorably discharged from the Armed Forces.

◆

Rogers Introduces Air Conditioning

Rogers Diesel and Aircraft Corporation, 1120 Liggett Avenue, New York 59, announces the acquisition of the manufacturing and selling rights to the systems of air conditioning and air sterilization developed by Research Corporation. Ralph R. Rogers, president, revealed that industrial and commercial air conditioning units are in production and air sterilization units for use in homes, hospitals, etc., will be on the market within the next few months.

The air conditioning units operate on the principle of chemical dehumidification. Humidity is controlled through the use of a chemical, triethylene glycol, which acts as a sponge upon the air, removing excess moisture. Triethylene glycol has a germidical effect on air-borne bacteria. Vaporizers using triethylene glycol will operate on ordinary house currents.

◆

Advance Appliance Stoker-ola Plant

The Advance Appliance Company, Inc., has just completed a new modern factory at 2400 South Adams St., Peoria, Illinois, where they will continue the manufacture of stokers under the trade name, Stoker-ola.

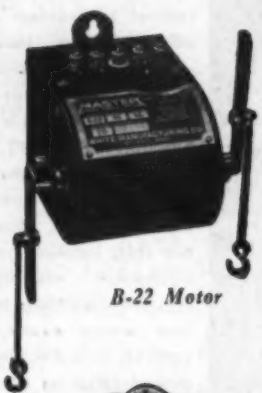
◆

Rudy Repair Parts

Rudy Furnace Company, Dowagiac, Michigan, has recently sold all repair parts and repair-part patterns for the Rudy top radiator and diving flue type furnaces to the Livingston Repair Company, Marshall, Michigan.

Repair parts will be available on these items from Livingston Repair reasonably soon.

MASTER
TEMPERATURE CONTROLS



B-22 Motor

D-22A Regulator Switch

Our Standard Products

Including those illustrated on this page, are coming off the production line in gradually increasing quantities,—but nowhere near the volume that our customers and we wish for. What production we have is being divided among customers as equitably as possible.

A-23 Plain Thermostat

The "MASTER" Mark on temperature controls means GREATER COMFORT . . . LONGER LIFE . . . MORE EFFICIENT SERVICE FOR YOUR CUSTOMERS . . . EASIER SALES FOR YOU.

WHITE MANUFACTURING CO.

2368 University Ave., St. Paul, Minnesota

Easy to use?

WELLS No. 8 METAL CUTTING BAND SAWS

The test of a machine is with the man who uses it. Ask men who've used Wells No. 8s, what they think of them.

"Easy to use" will be your answer. All you do is clamp your metal—any size or shape that will fit—into the quick acting vise. From then on, the machine does the work. Both feed and shutoff are automatic.

Because they are so simple to use, one man can operate two or more Wells No. 8s at the same time. One saw can be used for all odd metal cutoff jobs or can be equipped with a Wells Wet-Cutting System for quantity runs. Time and labor can be saved by moving the portable Wells to the work.

Any shop will use a Wells safely and efficiently. Skilled mechanics use Wells Saws to save time and work. Take a tip from men who know . . . because they use Wells Saws and like them. Put a Wells No. 8 to work in your shop . . . now.

Specifications

CAPACITY: Rectangular	8" x 16"
(Special Guides)	5" x 24"
ROUNDS:	8" Diameter
MOTOR:	½ H.P., A.C. or D.C.
SPEEDS:	Selective 60, 90, 130 feet per minute
WEIGHT:	Approximately 750 pounds

Products by Wells are Practical

Wells

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1810 WILSON AVE., THREE RIVERS, MICHIGAN

Something NEW!

VITROLINER

BREECHING PIPE

(SMOKE PIPE)

VITROLINER is a new LONG LIFE breeching pipe for connecting heating plant to chimney and will give many years of trouble free service. Eliminates the expense and bother of frequent replacement. A complete line of fittings makes any hookup possible and can be easily and quickly installed. VITROLINER eliminates the fire hazard of corroded pipe. VITROLINER is made of heavy gauge steel completely coated inside and outside with porcelain to prevent corrosion. VITROLINER'S porcelain finish is attractive and adds to the beauty of any room.

SPECIAL FEATURES: The Telescope section is adjustable in length and is used to fill in any odd length not accommodated by standard lengths. Eliminates need for cutting pipe. Installed at chimney end of breeching pipe.

The Vitroliner damper section has a cleanout hole covered with a sliding sleeve. The cleanout hole is also used for installing a barometric or check damper. Small holes also provided for butterfly damper.

Vitroliner is easily installed and is ideal for venting dust, gas, corrosive fumes, paint spray, etc.

VITROLINER CHIMNEY LINER CREATES MORE DRAFT

The porcelain surface of the liner is smooth, even, and is quickly heated and cooled. In less than 5 minutes the temperature is up to efficient operating temperature, thus providing an excellent draft and complete combustion in the heating plant. When heating plant is off, the liner cools immediately, and there is no draft to draw heat from the house. The Vitroliner liner is not harmed by acid condensation present in oil or gas-fired plants.

VITROLINER LINER can be installed in existing chimneys, easily and quickly—prevents chimney deterioration caused by *condensation*. Inspection of thousands of brick chimneys proves that an acid resisting chimney lining is necessary to protect the brickwork.

VITROLINER CHIMNEY LINER is heavy gauge steel, double coated inside and outside with acid resisting porcelain fused into the steel at 1575° F.

VITROLINER will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT. Can be easily installed in straight or offset chimneys. All sections are made on dies and the bell and spigot joints insure an accurate and uniform fit.

Write for further information on sizes, prices, etc.

CONDENSATION ENGINEERING CORPORATION

122 S. Michigan Ave. Chicago 3, Illinois

With the Manufacturers

L. D. T. Berg, for the past five years a sales engineer in **General Electric's Electric Welding Division,** Schenectady, has been appointed welding specialist of the company's Atlantic District with headquarters in Philadelphia.

Mr. Berg is a member of the American Welding Society and the American Institute of Electrical Engineers.

◆

Martyn Kingsland

Formation of a Specialties Division to handle sales and production of special products has been announced by **Minneapolis-Honeywell Regulator Company,** Minneapolis 8.

Martyn Kingsland, manager of the company's refrigeration controls division, has been named sales manager of the new department, and will consolidate the activities of his former department with the new division and expand personnel accordingly. The new division will handle modification of the company's regular heating and conditioning controls for special applications and speed production and delivery of instruments which must be made slightly different from standard products as well as the development and sale of new products

◆

General Controls Company, Glendale, California, announces the appointment of **Edgar P. Hollister** as manager of the New York factory branch.

Mr. Hollister, formerly associated with the Bendix Aviation Corporation will serve users of automatic pressure, temperature and flow controls in New York State, New Jersey and Connecticut.

K. G. Baker is back with **Wagner** [illegible] on of St. Louis (Indianapolis Office) as a field engineer after over three years active duty with the Army. Mr. Baker is a veteran of both World Wars. In World War I he served with the 32nd Division, spending seventeen months in France and with the army of occupation in Germany.

K. G. Baker

He returned to the Army on April 5, 1942, with the rank of Captain and went to Drew Field, Florida, as an S-4 officer, and subsequently became base executive officer; he moved up to Major and then to Lt. Colonel—and at the same time moved over to Africa.

Mr. Baker was in Africa for 9 months. At Casablanca he was executive officer and service and supply officer of Cazes Air Base.

◆

H. B. Axtell has joined with **V. A. Chern** to represent **Progressive Welder Company,** 3050 E. Outer Drive, Detroit 12, Michigan, in the Eastern District. Axtell and Chern have established offices at 15 Gramercy Park S., New York 3, New York.

Mr. Axtell, for over 10 years identified with resistance welding, brings a wealth of experience in both the design of equipment and the application of welding processes in a wide range of industries. During the war he was largely responsible for the setting-up of many of the welding processes in plants faced with the conversion to products requiring the highest production methods. As Progressive's representative he will continue to offer field engineering services on resistance welding to manufacturers in the New York area.

Instead of a Replacement Water Pan
Sell This Profitable PREMIER
Automatic HUMIDIFIER

A PREMIER Profit-Maker for the Independent Dealer

You can turn a minor furnace repair job into a profitable sale, by suggesting the installation of this PREMIER Automatic Humidifier!

Explain how *moist* warm air keeps furniture from falling apart, benefits health, and cuts coal bills. Point out that this automatic humidifier provides *more* moisture in the air, because this unit has a larger evaporating area — is located in the top of the furnace — and never goes dry.

Remember — it's a lot more profitable to sell this PREMIER Automatic Humidifier than it is to put in a replacement water pan. And — you can soon *get delivery* on these PREMIER Units.

PREMIER
FURNACE COMPANY
DOWAGIAC, MICHIGAN

Also:
CAST IRON AND STEEL FURNACES
WINTER AIR CONDITIONING
OIL BURNERS
BLOWERS
STOKERS
COOLING EQUIPMENT
REGISTERS
DUCTWORK
AUTOMATIC CONTROLS

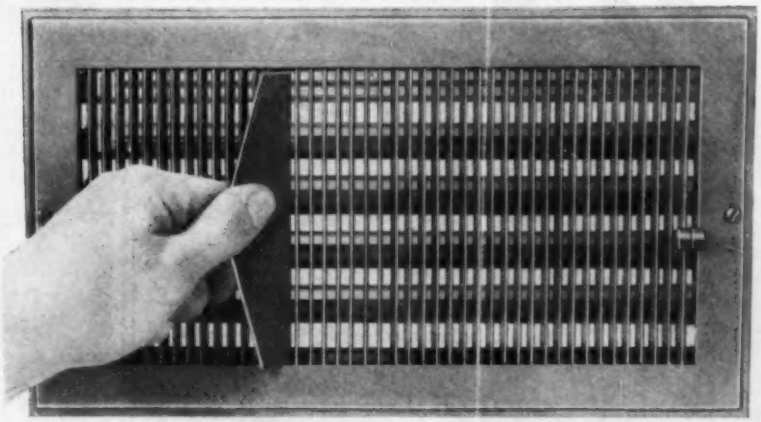
Let Your BETTER JUDGMENT Prevail

No. 256

AIR-CONDITIONING

REGISTERS

The Most Versatile of All A-C Registers. Non-Vision, Maximum Free Area. No Mullions in any Standardized Residential Sizes.



Standard Vertical Bar. Setting 22° Right, Lever-Left Flow. Lever operated Rear Valves Operated from 45° Down Flow to any Up Flow required. Standardized Sizes for Residential work. Any required Sizes for Commercial work.

File your Request for our New Streamlined No. 46 Catalog which will be ready for mailing soon.

UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Triangle engineers for fans, blowers and other devices requiring silent operation, perfect alignment and self-lubrication.

Preloaded oil-proof cushion built into the bearing.
Ball-and-socket design.
Write for samples and complete information.

TRIANGLE MANUFACTURING CO.

392 DIVISION STREET OSHKOSH, WISCONSIN

FOR VITALIZED HEAT

Convector HUMIDIFIER

In sizes to meet requirements of largest to smallest warm air furnaces. Now available for straight bonnets

When furnace check-ups reveal a need for humidifier replacement, or when new furnaces are indicated, install the Convector Automatic Humidifier. You not only make more money, you assure your customer more reliable and efficient humidification, even at low temperatures.

The Convector consists of one, two or four copper troughs built into a compact unit and fitted with highly absorbent patented evaporator pads, assuring free flow of moisture to exposed evaporating surfaces. This exclusive construction, together with the spacing of the troughs to permit unrestricted air flow, results in maximum evaporation.

Corrosion resisting materials. A non-back-siphoning automatic water feed valve, approved by National Plumbing Laboratory, guards against contamination of domestic water supply.

Convector models are now available for straight bonnets in fourteen sizes with single or multiple troughs from 15 to 34 inches. The units are easily installed and easily removed for servicing.

FURNACE MANUFACTURERS

On your new designs, hold up final specifications until you get the facts about our new, improved automatic humidifier. Send us your name so that full information can be sent to you as soon as specifications and materials are ready.

MAID-O'-MIST INC.

3213 North Pulaski Road
Chicago 41, Illinois

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

With the Manufacturers

R. H. Pentecost, has been made sales manager of Syncromatic Corporation, 5110 North Thirty-fifth Street, Milwaukee 9, Wisconsin.

◆

Carl H. Langendorf

Carl H. Langendorf has been appointed sales and service engineer for the St. Louis territory by **Surface Combustion Corporation**, Toledo, O.

Mr. Langendorf was assistant office manager of McDonnell Aircraft Co. before returning to the Toledo organization.

◆

Berger Manufacturing Division, Republic Steel Corporation, Canton, Ohio, announces the appointment of **William S. Davis** as salesman in the firm's Rochester, N. Y. territory.

Mr. Davis was with Milcor Steel Company from 1936 to 1942 and sold sheet metal building products in the Rochester territory.

L. H. Cook has become affiliated with Berger as salesman of steel building products, working out of the Indianapolis branch office. Mr. Cook has a background of over a quarter of a century in the building products field. He first started to work in 1916 with the Wheeling Corrugating Company and has been a salesman with that company since 1920.

◆

Harold J. McKay

Harold J. McKay has been appointed service engineer in the New York district for Janitrol gas-fired space heating equipment, **Surface Combustion Corporation**, Toledo, O., manufacturer of the equipment, announces.

Headquarters for Mr. McKay will be with Surface Combustion's New York district offices, Transportation Building, 225 Broadway.

◆

John Roland of Indianapolis, has recently joined the Engineering Department of **Conco Engineering Works**, Mendota, Ill.

Mr. Roland held the position of chief engineer with Stokol for many years while the Stokol Division was under the ownership of Schwitzer-Cummins Company of Indianapolis. He has been identified in the Stoker Industry since 1932 and has been active in engineering circles, on the Engineering committees of the Stoker Manufacturers Association, and is a member of the American Society of Heating and Ventilating Engineers and of the Society of Mechanical Engineers.

◆

Ed Goodwin

Ed Goodwin is now sales manager of the Furnace and Air Conditioning Division of **Perfection Stove Company** in Cleveland, Ohio.

The first furnace salesman employed by Perfection, Mr. Goodwin covered the middle west, always maintaining top position in sales volume and number of dealers appointed.

His previous experience includes 12 years with Standard Sanitary Manufacturing Company of Pittsburgh as Cleveland branch manager, and later as division manager of all their Ohio branches.

COOL QUICK
PROFITS
come your
way
with

SNO-BREZE
EVAPORATIVE
COOLERS

Profits come fast when you can offer customers SNO-BREZE coolers . . . the coolers with features customers demand. They're made and perfected in the air conditioning test ground: the Arizona desert. Backed by over 30 years of manufacturing experience. Horizontal blower type shown.

Present supply limited.
Order now for summer profits.

Palmer
MFG. CORP
Phoenix, Arizona

FICKLE SPRING WEATHER COSTS YOUR CUSTOMERS WASTED FUEL . . . UNLESS THEIR HAND-FIRED FURNACES HAVE

Automatic Temperature Control . . .

WITH THE A-P HEAT REGULATOR SET

In the spring, when the mercury is 'way above the freezing mark one day — followed by a quick dive toward the frigid zone within a few hours — automatically controlled heating in homes with coal-fired furnaces is especially appreciated. It provides comfort, plus a substantial saving in fuel. Only a minimum fire is maintained on warmer days, yet the sensitive thermostat instantly responds to a drop in room temperatures, quickly compensating for outside temperature changes.

BUILD GOOD WILL among your customers who own hand-fired furnaces — by installing this efficient, always-dependable A-P AUTOMATIC HEAT REGULATOR SET. It STOPS chance-taking waste in furnace firing.

Install Quickly and Easily — Like This:

Attach A-P Thermostat to inside wall, 4 feet above floor. It "floats" the fire and controls room temperature within 1° of the setting. Actuates damper control. Beautiful ivory-tone finish harmonizes with home furnishings.

Place A-P Limit Control on the furnace bonnet. It prevents furnace heat from overshooting room thermostat setting. Keep Limit Control adjusted to outside weather for satisfactory sentineling of fire.

Finally, install the A-P Damper Regulator and connect to Thermostat and Limit Control. It requires no attention except oiling twice a year.

COMPLETE INSTALLATION KIT contains pulleys, screws, conductor cable, staples, chain and transformer.

SALES HELPS—Display Cards, colored Presentation Books, Consumer Folders, Newspaper Mats—furnished upon request.

PRODUCTION AND DELIVERIES are now back to normal. Keep well stocked to serve customers promptly.

AUTOMATIC PRODUCTS COMPANY
2470 North Thirty-Second Street, Milwaukee 10, Wisconsin

DEPENDABLE *Controls*

FOR HEATING • AIR CONDITIONING • REFRIGERATION

New York State Convention

(Continued from page 95)

electrical work gets $4.70 to $9.70. These figures definitely prove that our industry is not getting its proper share of the building dollar. The other crafts, which show a higher percentage, have obtained this acceptance through cooperative effort on the part of local, state and national associations.

Furthermore, pointed out President Varden, our industry is losing considerable ventilation and blowpiping equipment, material and installation to other trades; we have lost much copper work to plumbers who install cast iron drains; steel roof decking is being installed by structural iron workers even though steel roof decking is definitely a part of sheet metal work and finally, said President Varden, bid-peddling has been taking a large slice of our profits.

Sheet Aluminum

Mr. G. F. Palmer, Aluminum Company of America, speaking on "Aluminum as a Sheet Material" showed a film of ways and means of using aluminum sheet for general architectural work. Mr. Palmer explained that as a result of uses in the war and research conducted during the war, aluminum is now available in a wide range of characteristics and is adaptable to almost any type of sheet metal work.

The discussion developed that spot-welding is easy with aluminum, if the aluminum is chemically or mechanically cleaned. It was also brought out in the discussion that there are places where aluminum does not give satisfactory service. For instance, the under side or ceiling of a marquise accumulates street dirt which is not washed off by rains and the moisture in the air, affecting the accumulated dirt, frequently sets up corrosion which results in pitting of the aluminum surface. Aluminum used on steep roofs where the aluminum is frequently washed by rain does not show such deterioration from dirt and moisture. The question was raised whether or not aluminum is satisfactory for air conditioning system duct work where relatively high humidities are present. Mr. Palmer expressed the opinion that if dirt passes through the system, deterioration can occur, but if the system has complete cleaning, it is likely that the aluminum will not show corrosion. It was very interesting to members to hear Mr. Palmer say that aluminum is not generally satisfactory for box gutters because to braze the joint of a box gutter requires raising the temperature of the material to 1100 deg. at which point the underlying wood is likely to char. Furthermore, hanging gutters and downspouts frequently corrode rapidly because of the accumulation of wet leaves and dirt in the gutters. Mr. Palmer also said that flat-seamed roofing is not practical because of the difficulties of brazing flat seams over underlying wood supports.

Copper Gutters

At another luncheon Revere Copper and Brass Incorporated showed their motion picture, "A Step in Time," which shows Revere's research in the construction of box gutters to eliminate buckling, cracking, etc. Very briefly, this research developed the fact that if heavy enough copper is used, (such as 32-oz.) the individual sheet and the gutter as a whole have enough inherent stiffness to provide longitudinal

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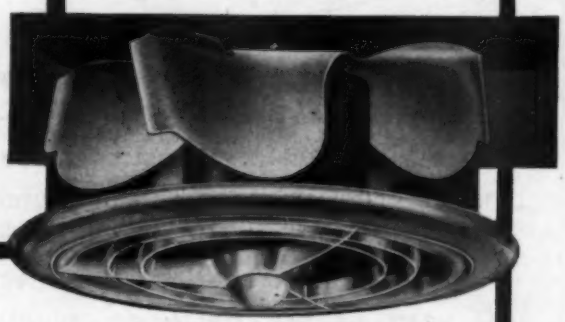

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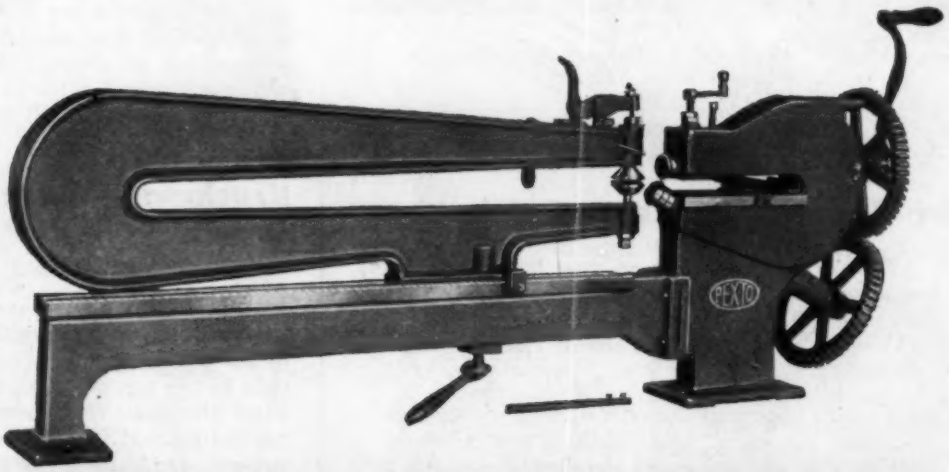

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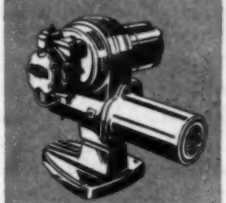
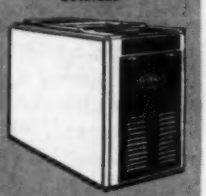


THERMATIC OIL BURNERS



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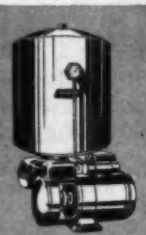

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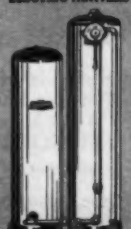

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That drum of Fireline on your truck is a real money-maker. Figure it out: firepot repair jobs are plentiful; the way to make money is to do all you can handle—fast. You collect Fireline's higher profit percentage.

Fireline is a putty-like refractory in moist, plastic form. It's ready to use—nothing to mix—nothing to add. Quickly, easily installed, it provides a durable lining that produces a hotter fire across the entire fuel bed. It is often used, in fact, to preserve firepots still in good condition and to improve combustion efficiency. For steel furnaces, it can be moulded to any shape to replace refractory tile.

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movement without buckling or cracking. The use of the ordinary 16 oz. copper is not recommended without stiffeners.

Stiffeners were developed as a result of this research and consist of box sections which are placed at the bottom of the inside or the back side of the gutter. The movement, due to expansion and contraction, is transmitted by the stiffeners so that the copper sheet of the gutter does not buckle and does not crack.

Revere established an accelerated testing procedure and subjected gutters with stiffeners to the test. Sixteen oz. copper gutters without stiffeners failed in the first two or three cycles of heating and cooling. Gutters with stiffeners were put through five hundred alternate heating and coolings and no buckling and no cracking occurred. Thirty-two oz. copper also was subjected to five hundred alternate heatings and coolings and did not buckle or crack.

◆

Kruckman—Washington Is Drowning in VHP No. 1

(Continued from page 83)

eral Metalware Company, Minneapolis, pointed out that purchases from warehouses spelled an advance of $20 per ton, while deliveries from the mills involved only $2 per ton advance. Patrick Treacy, head of CPA Steel Division, further comforted the manufacturers by stating that there is nothing the CPA can do under present regulations to compel the mills to produce galvanized sheets or black plate or any other steel. It can only direct the mills where they shall apply the steel they make. In other words, CPA is able to channel sheet metal where the Government decides it might be most useful.

V. P. Diedrich, of the Owatonna Manufacturing Co., Owatonna, Minn., drew attention to the fact that the automotive people were able to accumulate 100% supplies of steel and keep them in boxcars on sidings while the strike was in progress, and that the average small metal fabricator inevitably was compelled to wait from 9 to 12 weeks, with priorities, to receive the steel. Repeatedly he, and other witnesses, pressed for an answer to the question why the small manufacturer might not be helped by CPA to obtain a proportionate share, in relation to the quantity delivered to the larger customers, and with the same speed that the mills served the larger customers. General Sales Manager Edward A. Livingstone, of the Babcock & Wilcox Tube Co., Beaver Falls, Pa., suggested, "If it is true the steel wage-price controversy is settled by a flat per ton across-the-board increase in the prices of steel products, then there definitely would seem to be a conspiracy between big steel companies and the labor unions sponsored by some source of Government to squeeze out of existence the small but important steel companies. After all, all steel comes from pig iron or ingots, and the variation in the forms in which it reaches the market is governed by the amount of additional labor which is applied to it in processing it to its finished forms. The variations in selling prices of all steel products are a direct reflection of the amount of labor involved in their processing."

Steel Delivery Confusion

Both Capt. Small and Director Treacy, of CPA, stressed that after the steel strike there was what they called a "shake-down period." This period was

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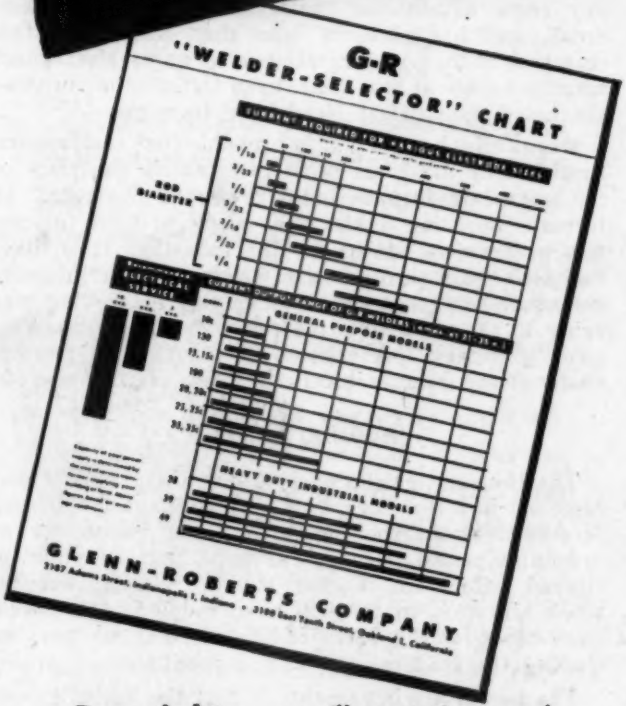

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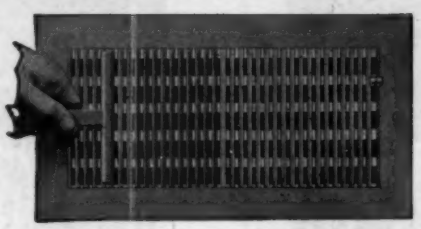

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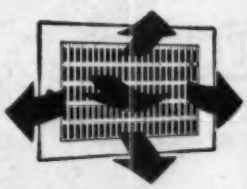

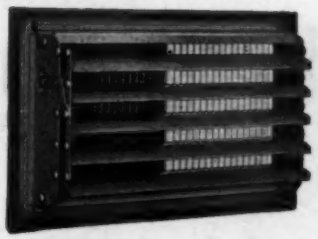

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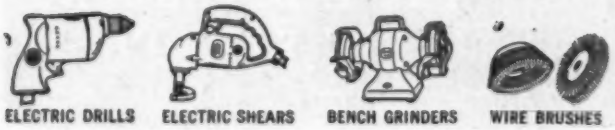

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more prolonged than was expected. They also made clear that ratings which were suspended when the strike occurred might be suspended indefinitely. Treacy, particularly, emphasized that during the shake-down period there will have to be changes in whatever practice existed before the strike, in relation to the shipment of orders in the sequence of the ratings which existed before the strike. He said he thought the mills would give preference to the orders which were already booked. But he was careful to qualify, that, because of mechanical difficulties and the normal partial operations, there would in all likelihood be a "distortion" of the "order pattern."

Mr. Treacy did not say so, nor did Capt. Small, but it was apparently the general impression that the "distortion" of the "order pattern" might be the needs of certain larger steel consumers, and that the object of preserving the "pattern" was to secure maximum full-scale operation in the steel mills to permit whatever voluntary preferential deliveries the mills deemed essential, with the hope that all steel users will rapidly come within the "pattern." Apparently, Capt. Small, and his advisers, fear they may upset this objective if they restore ratings to warm air furnace manufacturers at this time, even though the furnaces are listed as Critical Needs for Housing.

Meanwhile, however, it is probable that the Heating Branch may make an effort to establish the place of the warm air furnace industry in the "pattern," by formally applying to the steel people of CPA for certain preferential status for the industry. It is likely this action will set in motion within CPA further consideration, and that the result of this proceeding may bring to the steel mills the recommendation that certain "voluntary" preferences be given to the requirements of the manufacturers of warm air furnaces.

Housing Subsidy

The Housing legislation is still in Congress. It may come out in a few days, or it may be suspended in conference between the Senate and the House for an indefinite period. There was hope that it might be cleared before the Easter Holiday recess; but the whole situation on the Hill is so raddled with dissension, blocs, and general confusion, that no one, including the leaders, will risk a prediction.

The prevailing impression is that the bill will eventually go to the White House with a provision for $400,000,000 subsidies, and without ceilings on real estate or existing housing. The premium payments, approximately two-thirds of the subsidy potential, are designed to expand production. In other words, those who make equipment or materials will receive subsidies only if they expand beyond their present profitable production. The plan is designed to avoid price increases on present profitable business. Above all, it is impressed upon us that the subsidies will not go to veterans, and that all price increases that might occur must be absorbed before they get to the level of the veteran.

It still is not clear what the ceiling may ultimately be on the housing. The usual figure is $6,000. Lately, there has been a decided swing towards the idea that large apartment houses, and multiple-dwellings must be encouraged, since the veterans apparently are far more inclined to rent than to buy. The rent ceiling is to be fixed at $80 per month. The plan apparently remains anchored to the idea that approximately one-third of the small houses shall be prefabricated dwell-

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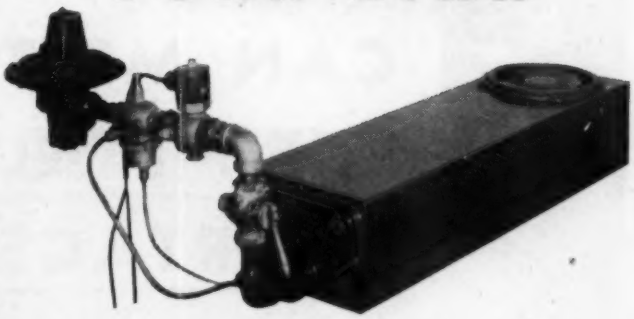

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ings. The general plan is that the Government shall buy whatever houses the prefabricator cannot otherwise sell. The total of housing required, as basis for conversation, at least, is the familiar figure of 2,700,000 units. No one seems to know exactly where that total was obtained. It is probably a mean estimate based upon the numerous calculations which have been in the air during the war years. No allocations have been made to areas, regions, or communities. Wherever such allocations may appear, it is probable they have been suggested by local enthusiasts.

Opposition Is Widespread

The opposition to the program has naturally come from contractors, building material manufacturers, and the construction industries which have followed the time-honored methods. They fear new competition, and an upset of existing codes and systems. They regard the whole program as an adventure into socialization which will end up in Government domination of the construction industry.

The A. F. of L. is opposed to the plan because the building trades believe the enterprise will result in the invasion of the field by the C. I. O., which has always been the champion of the prefab. Approximately $400,000,000 already has been provided by Congress, which is being spent to move and restore barracks, and other housing, in Army and Navy communities. Apparently nobody is opposed to this part of the program.

The general background at the moment shows a premeditated inertia by the larger contractors. They are content to do nothing, and to encourage others to do nothing, for the next 60 or 90 days. Most of them are engaged in completing substantial jobs which came under the wire as being in process of construction when the VHP No. 1 was promulgated on March 15. The do-nothing program presumably might help to make the construction restrictions inoperative. The average larger contractor will tell you the restrictions will not work. You hear the same thought in conversation with many architects. The smaller contractors appear to be grabbing all the contracts that CPA and FPHA will approve. Over 250,000 applications have been approved, even though the area offices have not had an opportunity to really get started.

Construction Lobby

There has been an extremely active and numerous lobby busy in Washington in opposition to the legislation. It has represented real estate, lumber, material manufacturers, equipment producers, banks, and several commercial organizations, as well as groups of builders and various labor units. It is curious that a substantial number of construction people have aided the legislation. From the beginning these groups have insisted that only a small segment of the industry would be affected, that the largest part of the non-housing construction industry would be able to secure materials and labor and facilities and permits to continue the development of at least $11,000,000,000 to $12,000,000,000 worth of work. This has been variously confirmed by Wyatt and Small.

During the latter days of the drive, the lobby in Washington has appeared to fall apart. There has been much complaint about a lack of leadership in the industry. Moreover, it is singular that there have been few controversies the past year that have generated so much heat and bitterness, and so much misinformation. There are sound and decent people here who regard Wyatt as something between Robespierre and

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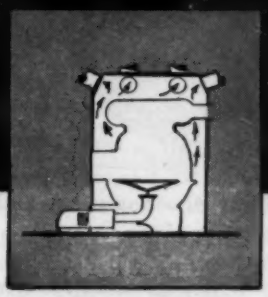

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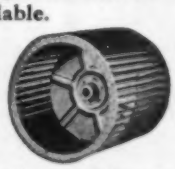

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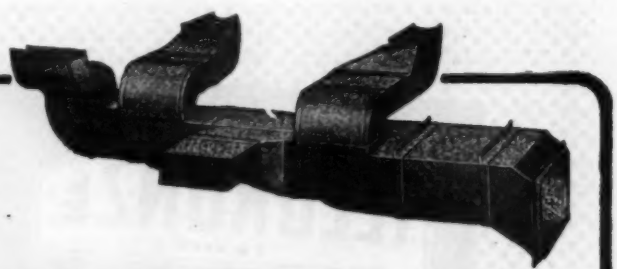
Hitler; and there are others who deem Bowles as the most adroitly tricky person Washington has produced for many generations. It is yet too early to say with exactitude what the whole housing adventure may or may not bring forth. By the same token it is not yet clear that Wyatt is a Czar who will have the power to divert the efforts of many parts of the economy from their present purposes to purposes in which they have no interest.

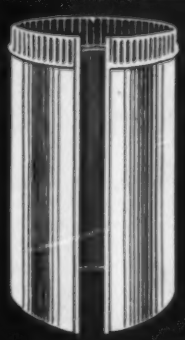
There are people here who honestly think Wyatt will be able to direct the economy of the nation, make prices, control labor, and generally run the affairs of the nation. And there are others who just as implicitly are convinced that Wyatt is the Voice and the Front, while Bowles is the Brain. It is common talk that Wyatt will absorb Small's job, and that Bowles will run Wyatt. Actually, both men appear to be unusually gifted, one with courage, patience and plenty of intellect and persistent stubbornness; and the other, Wyatt, with a persuasive tongue and a hypnotic personality that is extraordinarily convincing. Wyatt is generally credited with the purpose of prolonging the housing fight so as to extend the general program well beyond 1947, in order to make it useful in the Presidential campaign. Wyatt is a politician; a consummate politician. But it is doubtful if anyone actually knows what the facts are—because apparently the whole gaudy mess has been so boiled and bubbled and stirred, that probably even Bowles and Wyatt—and, incidentally, Truman—do not recognize the plan they originally defined. As a matter of fact, it is certain the specific aspects of the whole enterprise cannot be clear and sharply outlined until Congress has acted, and the smoke has cleared away, and Wyatt can determine exactly what is left of the original purpose.

CHAR-GALE



● Because they're already engineered to save you time and trouble, you can make extra profits with Char-Gale "Pre-fabricated" Ducts and Fittings. Made by standard mass production methods . . . all sizes are accurate . . . no delays on the job. Try us on your next installation.

Pre-Fabricated DUCTS *and* FITTINGS

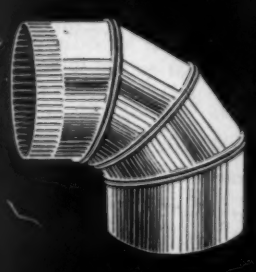


SMOKE PIPE

◀ Backed by years of experience, the Char-Gale double offset lock gives continuous satisfaction.

ELBOWS

Easy to adjust . . . extra large segments . . . won't come apart. Char-Gale elbows are trustworthy. ▶



PRE-FABRICATED AIR DUCTS

▲ The "quick-method" chart in the Char-Gale catalog gives accurate sizes for any job and figures costs for you. Send for it.

CHAR-GALE MANUFACTURING CO.

CATALOG NO. 40

For complete information on smoke and stove pipe, elbows, warm and cold air pipe, registers and air filters write CHAR-GALE Mfg. Co., 3125 Hiawatha Ave., Minneapolis 6, Minn.

UNIDUCT

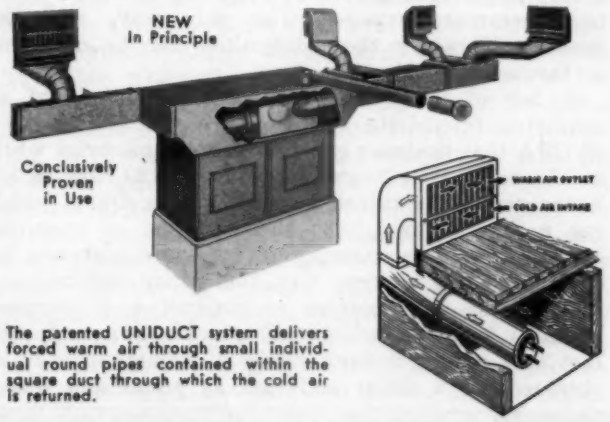
T. M. Registered

Revolutionizes DUCT INSTALLATION —A *New* and *Positive* Factor in HEATING EFFICIENCY

LOW INSTALLATION COST—SIMPLE "ONE-TRIP" BALANCING

Conserve your manpower! UNIDUCT easier, simpler installation requires less manhours—enabling you to make more installations, more profits with your present manpower.

One Trunk for both warm and cold air!
One Register for both warm and cold air!
One Stackhead for supply and return!
One Plenum for warm and cold takeoffs!



The patented UNIDUCT system delivers forced warm air through small individual round pipes contained within the square duct through which the cold air is returned.

Easily installed in old or new houses.
More Even Temperature—more floor space.
Minimizes combustion and mechanical noises.

HERE IS A TYPICAL LETTER FROM A USER

We have installed over one hundred UNIDUCT Systems and can honestly say every single one is operating perfectly.

"Fifty-two years' experience in installing furnaces has made us very familiar with the problems of forced air heating. The two greatest benefits we have found in the UNIDUCT System is that drafts and difficulty in balancing are completely eliminated. All rooms heat evenly. There are no cold corners or drafty spots."

(Signed) E. Kluegel & Company, St. Paul, Minn.

WRITE TODAY FOR COMPLETE INFORMATION.

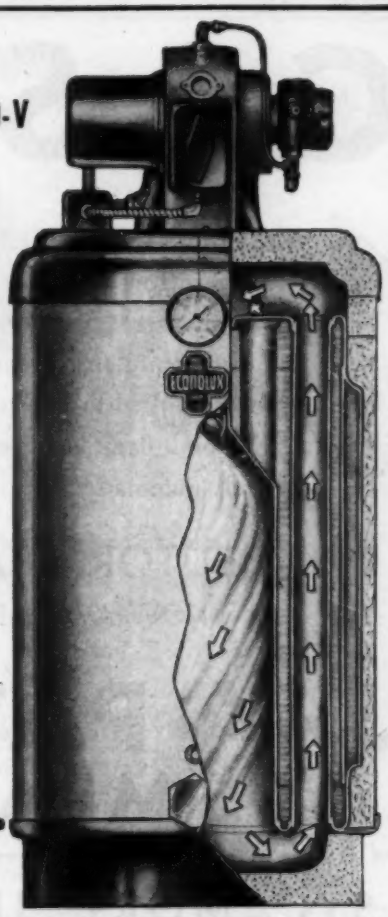
GENERAL HEATING PRODUCTS CO.
3553 University Ave. S.E. Minneapolis 14, Minn.

Introducing the new ECONOLUX 150-V

A compact "packaged" Oil Burner Unit!

Supplies low-cost, automatic heat for a 10-room house!

Supplies night-and-day domestic hot water!



Dealers are enthusiastic about the new Econolux 150-V because it is so easy to sell and so easy to install. Though it is only 24 x 60 inches in size, it has abundant power and capacity for any average house, store, or small commercial building.

It comes completely assembled, with the burner, automatic controls and wiring mounted and set for use. Connections to the flue, wiring circuit and water lines can be made quickly and inexpensively, without eating up the profits on the sale.

Homeowners like the Econolux 150-V because it provides abundant dependable heat, plus an ample year 'round supply of automatic hot water for every domestic need without a separate tank. It is completely automatic! It's quiet! It is so small and so attractive looking that it is welcome in the kitchen or laundry if no basement is available. Most of all, they like its faithfulness and the way it cuts their fuel bills.

If you want information about the profits you can make by selling the Econolux 150-V and other Johnson Oil Burners, write to us. We will gladly tell you if there is a Johnson Dealership open in your locality.

ECONOLUX 150-V SPECIFICATIONS

Powered by the famous Johnson Bankheat Burner with 150,000 B. T. U. per hour output. Fires downward through 13 heavy 2" fire tubes in a two-pass action. Double shell domestic-hot-water jacket has approx. 10 gal. storage capacity, and approx. 1750 sq. in. of heating surface for virtually instantaneous heating. Designed for either gravity or forced Hot Water Heating Systems. Heavily insulated. Refractory lining (in base only) can be replaced without dismantling boiler.

NATIONAL OIL HEAT EXPOSITION · COMMERCIAL MUSEUM · OHI · PHILADELPHIA · APRIL 23-27, 1946

Johnson Oil Burners

S. T. JOHNSON CO.
940 Arlington Ave., Oakland 8, Calif.
401 No. Broad St., Philadelphia 8, Pa.

J • V • PATTEN CO.

SUN

FUEL-MASTER
AUTOMATIC FURNACES

OIL?

SUN Automatic Oil Furnaces are now available in limited volume. Re-designed, better than ever . . . sizes 100 - 135 - 165 - 200 thousand B.t.u. per hr. . . . Vertical & Horizontal types. Multiple units to 700 thousand B.t.u. for Industrial Applications.

GAS?

The new SUN ELECTRONIC GAS FURNACES will be available about July of '46. An all-steel line of gas units employing the new *Electronic Instantaneous Ignition* principle as applied to injector type gas burners . . . No pilot flame . . . Clean . . . Efficient . . . Entirely automatic!

DISTRIBUTOR FRANCHISES
NOW AVAILABLE

J • V • PATTEN
COMPANY
MANUFACTURERS—ENGINEERS
SYCAMORE, ILLINOIS

Ohio State Convention

(*Continued from page* 92)

mistakes such as the blanket approval of an 18½ cent per hour wage rate for one industry without realizing that this means a similar increase in all industry.

As a result of this lack of knowledge on the part of government, the whole nation now finds itself in an increasing price spiral. In the months to come wages will increase; then prices will go up; then the cost of living will rise; then workers will need more wages and so on with ever-increasing rapidity without either labor or the consumer ever reaching the place where the individual profits by the spiral. It is to be hoped, said the speaker, that this whole procedure stops before the average individual is confronted with one of two decisions—either he must go to work for the government or must reconcile himself to giving a very appreciable percentage of every dollar he earns to government expense. The only way, said the speaker, by which these difficulties can be overcome is through organization.

A few of the things the speaker pointed out as requiring immediate attention are (1) the attitude of OPA that business can sell at the same price while at the same time increasing wages; (2) the $6,000 house now being talked about is just a dream which can not be realized; (3) there can be no wage increases without accompanying increased cost and increased selling prices; (4) the entire construction industry should organize to conduct a widespread publicity program which will educate owners to the fact that only a dollar's worth of value can ever be obtained for a dollar and that as prices and wages

YOUR CUSTOMERS WANT
Healthful Comfort

Always Provide It!

Thermo-Drip Humidifiers moisten air as it is heated, in direct proportion to temperature. Thermo-Drip Humidifiers regulate water feed and control the amount of evaporation. Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation and insure complete satisfaction to your customers. Get all the facts on Thermo-Drip Humidifiers now. Install them on any type or make of furnace for correctly balanced humidification and healthful comfort. Write us today.

Automatic HUMIDIFIER CO.
CEDAR FALLS . . . . . IOWA

THERE'S A THERMO-DRIP HUMIDIFIER
FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE

and costs go up, the purchasing dollar buys less and less.

The Steel Situation

Bennett S. Chapple, Sr., American Rolling Mill Company, reported that the steel industry is now in a place where the swing of the pendulum from good times to bad times and back to good times is in the position of bad times. The World War which has just been concluded created the greatest crisis in history and by no stretch of the imagination can it be expected that conditions will be normal so soon after the ending of this war. The only hope is that all industry and all consumers and all business will be patient and realize that only time can iron out the difficulties which now confront us.

Mr. Chapple said that iron and steel is a basic industry but that this last world war was a sheet metal war. Sheet metal was used for all kinds of things in greater volume than ever before in history. This increased use of sheet metal would have been impossible without continuous rolling. Despite the increased capacity for rolling sheets from four and a half million tons in 1928 to twelve million tons in 1937 to fifteen million tons in 1940, there still are no sheets available. During the war years, at peak production, the mills rolled at a rate of twenty-five million tons of sheet per year, but this rate was only of short duration and can not be expected to continue during the next few years. All the mills, said Mr. Chapple, are trying desperately to catch up on the tremendous backlog of orders which now confront them. But before mills can reach maximum production, there must be increased prices in order that mills can employ labor and can show a reasonable

You've tried others
NOW TRY THE "BARNES BETTER BILT"
DUAL FURNACES

This furnace is installed through wall and floor cuts. No trap door needed. Furnace is 26" deep, no pit required. The attractive non-vision grille is all you see.

Write for latest bulletin

H. C. BARNES, INC.
Sales Office: 330 E. Fourth St.
Factory 449 W. Anaheim St.
Long Beach 2, California

Brundage

BLOWER UNITS and ASSEMBLIES
Maintain their Pre-war Quality Construction
And that is why you are sure of superior performance, economy of operation, and few, if any, service worries.

THE Brundage COMPANY
BLOWER SPECIALISTS
Since 1919
KALAMAZOO 11, MICHIGAN

Barth
U. S. A.

COMBINATION MACHINES

BARTH offers a wide range of Combination Machines for burring, edging, wiring, turning, and flanging. Three sizes are furnished with roll diameters 1½", 2⅛", and 3¼". Capacity to 18 gauge.

All newly designed and sturdily built to meet *your* requirements.

THE BARTH MANUFACTURING CO.
MILLDALE, CONN.

Furblo

Sectional construction and square shape permits access door to be placed on any side of cabinet.

PERFORMANCE • ACCESSIBILITY

You're sure of finest performance when you install Furblo Furnace Blowers. Equipped with quiet, long hour duty motors that are rubber mounted and meet all power company requirements and have automatic overload cutout protection, Furblo Blowers meet every demand for best performance. Dustop filters, Minneapolis-Honeywell controls, variable speed V-belt drive. Manufactured by the pioneer furnace blower manufacturer. Get complete details now.

FURBLO CO., HERMANSVILLE, MICH.

profit for their efforts. No one in the steel industry, said Mr. Chapple, actually knows what the final outcome will be, but it is quite likely that there will be scarcities of steel sheet all during 1946.

Heating Schools

Clarence Grandstaff, C. A. Olsen Manufacturing Company, outlined some of the plans of the National Warm Air Heating and Air Conditioning Association for 1946. Through co-operative effort on the part of heating dealers and the manufacturers, the speaker suggested that there should be less competition between furnace men and more competition between the warm air heating and the radiator industry; that through co-operation, standards of design and installation can be raised so that all warm air heating systems will be properly engineered and properly installed; to this end the National Warm Air association has recently made available several new manuals which can be used for dealer education and for proper design and installation procedure.

Mr. Grandstaff then briefly described booklets I, II, III, V and VII of the new forced warm air heating text book. These sections cover the calculation of heat loss; an analysis of frame house construction; how to make a comfort survey; a new gravity code and a new forced warm air manual. Mr. Grandstaff briefly described and demonstrated the use of several of these new codes and manuals and strongly urged contractors to obtain copies and study these booklets. He announced that the National Warm Air association has recently employed Mr. G. A. Voorhees of Indianapolis to conduct a series of dealer schools around the country in 1946. Announcement of the place and date of these schools will be made as soon as finally decided upon.

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

No. 20 BALL BEARING PUNCH

Capacity ½" Thru ½"
Weight — 18 Lbs.
Punches & Dies
⅛" Thru 13/16" by 1/64" Variation

No. 16 ROLLER BEARING LEVER BENCH PUNCH →
Capacity ⅜" thru ¼".
Throat Depth—3½".
Punches & Dies—⅛" thru 9/16" by 1/64" variation.

← **NO. 17 ROLLER BEARING LEVER BENCH PUNCH**
Capacity ⅛" thru ¼".
Throat Depth—6½".
Punches & Dies—⅛" thru 9/16" by 1/64" Variation.

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

PLANNED SERVICE pays 3 WAYS

The Grand Rapids Furnace Cleaner increases your profits by enabling you to merchandise through your service department. While you make money on the cleaning you make an additional amount by selling new equipment and repair jobs. This planned service pays in a third way, too, for it saves vital fuel by keeping your customers' furnaces operating efficiently.

The sturdy Grand Rapids Furnace Cleaner is soundly engineered to give years of satisfying service. It cleans thoroughly, sucking out all dirt and dust, eliminating "plug up" conditions. Quickly cleans furnaces, boilers, chimneys, stokers, oil burners, heaters — or the entire basement. Write for complete details.

GRAND RAPIDS FURNACE CLEANER
MODEL OF *The Doyle* VAC-IT

DOYLE VACUUM CLEANER CO., 227 Stevens St., S. W., Grand Rapids 7, Mich.

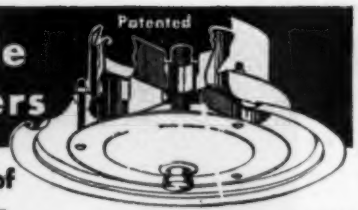
Heating System Controls

John Platz, Minneapolis-Honeywell Company, described the company's "Moduflow" system of heating control. He stated that many systems are unsatisfactory because of: (1) poor air distribution; (2) poor control of the heating system. Mr. Platz described the "Moduflow" system briefly as a practically continuous operation of the fan and varying register air temperatures. This method of operation and control is obtained by one of three variations of the basic system—(1) the reset method; (2) volume control; (3) the by-pass method. These three variations of the "Moduflow" system have already been described in American Artisan.

Under the reset method, the bonnet air temperature is increased or decreased according to outside temperature. Under the by-pass system, varying amounts of recirculated air or outside air are passed through the heater or by-pass the heater, according to the outside temperature.

Mr. Platz described the publicity program which is now being conducted by the M-H Company. Dealer schools are already in operation in many parts of the country; utilities and builders and manufacturers will be contacted by personal representatives; the radio and direct mail and national advertising are all being used to describe the merits of this type of control. The speaker also said there are available for use by contractors films which can be shown at luncheon meetings if the contractor has suitable projection equipment. Presentation of the control method will be given before home-planners groups and dealer-groups and housewives groups. The company visualizes three markets: (1) in new homes of the better

Adjustable Air Diffusers



Any desired condition at your fingertips

For better mixing of room and supply air, more uniform temperature throughout the occupied zone and noiseless air diffusion.

Kno-Draft Type K Adjustable Air Diffuser with Type D volume damper

Whether they are used in heating, cooling, ventilating or combined systems, Kno-Draft Adjustable Air Diffusers can be adjusted quickly and accurately for system balancing and individual or seasonal requirements. By simply turning the air adjustment screws (easily accessible from under the unit) the inner cone may be raised or lowered to secure any angle of air direction required. The built-in volume damper (regulated by the hand-turning knob) varies the air outlet aperture uniformly without affecting the outlet velocity or diffusion pattern.

Free handbook: contains clear sketches, charts, dimension prints and instructive text that simplify the selection and installation of air diffusers. Please write Dept. J-14 for your copy, using your company letterhead.

W. B. CONNOR ENGINEERING CORP.

AIR DIFFUSION AIR PURIFICATION AIR RECOVERY

114 East 32nd Street New York 16, N. Y.

CONNOR

LINE UP NOW WITH ECON-O-COL STOKERS

. . . to cash-in on the huge backlog of stoker sales! You increase your profits through faster sales, make fewer service calls by selling ECON-O-COL's complete line of precision-built, highest quality stokers. And a hard-hitting promotional program backs you up every step of the way! Details of our exclusive dealer franchise, now available in several areas, await your inquiry. Write or wire us today.

ECON-O-COL COAL BURNER — THE SHIELD OF QUALITY

ECON-O-COL

The "Stronghearted" Stoker

BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS

"Mr. Tops," The Paragon Symbol of Top Quality

7-Day TIME SWITCH

CALENDAR DIAL

—Calendar dial . . . providing individual daily settings for weekly schedules with holiday and Sunday shut-off and advanced time cut-off Saturday noon. 6" clear line 7-Day calendar dial calibrated to hour and half hour markings. 14 adjustable rider type trippers, thumb screw set, standard.

PARAGON ELECTRIC COMPANY

719 Old Colony Building, Chicago 5, Illinois

$24.50 LIST

Telechron MOTORED

Paragon Chicago

BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1903

EFFECTO-GRILLE

FORCED AIR

REGISTERS and GRILLES

Priced with the Lowest

Prewar quality . . . Adjustable Fins . . . Positive shutter operation . . . Reasonably prompt shipments.

WE ALSO MANUFACTURE A COMPLETE LINE OF GRAVITY REGISTERS AND GRILLES

Prompt attention to all inquiries.

EFFECTO-GRILLE COMPANY

9930 FREELAND

DETROIT 27, MICH.

type; (2) conversion or old residences where modernization is called for; (3) old houses with systems which should be completely discarded and new systems installed.

Entertainment

The jobbers and manufacturers serving contractors in the State of Ohio gave the convention a buffet supper and floor show one evening and the Columbus association tendered the annual banquet and perhaps the best entertainment staged so far this year.

◆

Control of Abrasive Dust

(*Continued from page* 88)

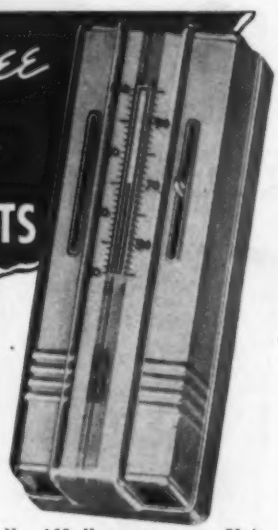
5 inches. The test is made by drilling a ⅛-inch hole in the branch pipe farthest away from the fan. A rubber hose is placed over this hole and leads to the U tube. The test is made at right angles to the flow of air and is called a static test.

In other states the law is more lenient. For example, in New Jersey and New York, a pressure sufficient to displace two inches of water in a U tube is considered sufficient. The Ohio law specifies a 2½-inch displacement. In some states it is legal to operate grinding and polishing wheels with absolutely no means for dust removal.

Thus in a large nation composed of 48 states, each exercising sovereign powers within its own jurisdiction, it is apparent that a uniform dust removal law would be impossible inasmuch as no legislative body has power to pass and enforce such a law. Of course, the dust disposal equipment manufacturer must take

for worry-free sales...

G-A THERMOSTATS



● Dealers like to handle Gleason-Avery Thermostats, because they're fast-selling, give the safe, accurately controlled heat that customers want.

Easy to install, too . . . *and* you don't have to worry about costly service calls. (G-A exclusive Straight Line Control eliminates troublesome sprockets and rotating arms; in case of current failure, draft damper closes automatically and check opens.)

Approved by Anthracite Industries Laboratory

No. 130 Furnace Safety Unit Package for hand-fired systems, complete with thermostat, damper motor and accessories —ready to install.

LIST PRICE . . . $20.45

Plus installation charges

Direct orders accepted when accompanied by wholesalers' name.

Gleason-Avery, INC.

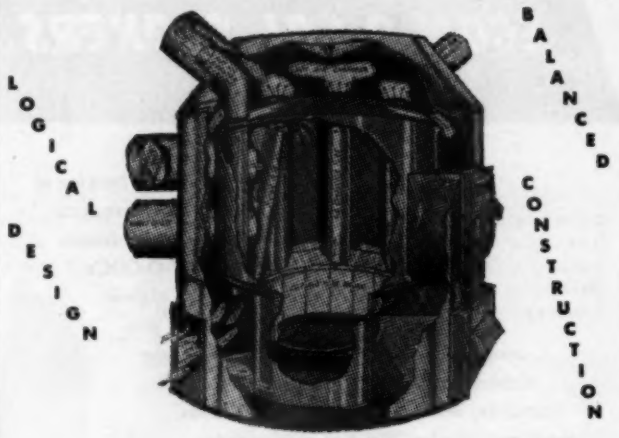
AUBURN, N. Y.

A RELIABLE NAME IN TEMPERATURE CONTROLS

TRADE MARK

Radiant TUBERATOR Heater

TRADE MARK



PAT. APPLIED FOR

31 EXCLUSIVE FEATURES

Write for Information

MANUFACTURED BY

WHEELING FURNACE CORP.

MARTINS FERRY, OHIO

TRADE MARK

TRADE MARK

state laws into consideration when designing a specific dust removal system.

Those conversant with polishing and grinding practice in various manufacturing centers are aware that many dust removal systems are of the home made variety and often these are inadequate for the purpose. Chief defects of such systems are piping of too small diameter, too many sharp elbows, branch pipes leading into main pipes at right angles or at the bottom of the main pipe, insufficient fan capacity, and collectors too small for the system.

While it is true that any sheet metal worker can build and install a dust collecting and disposal system by rule of thumb methods, real economy is assured only when such construction is designed and installed by concerns who make a business of this line of equipment. Such a contractor can guarantee his product to operate at the lowest cost possible, to remove dust effectively, and to conform to state laws.

NOTE—The author is indebted to the American Blower Corp. for much of the technical data given in this article.

Neubecker—Pattern For Floor Sweep

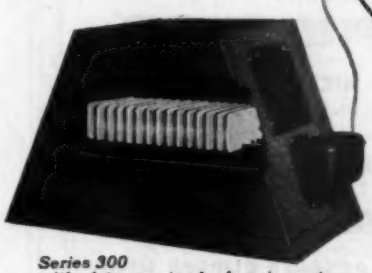
(*Continued from page* 85)

24 and using *6* and *14* in Fig. 26 as centers, describe short arcs as shown by similar numbers.

Set the dividers equal to the numbered divisions between *3* and *5* in plan in Fig. 23 and starting from the intersecting arcs at *5* in Fig. 26, step to arcs *4* and *3* on both sides as shown by the heavy dots. Trace a

WHY SKUTTLE HUMIDIFIERS are EASY TO INSTALL . . .

THE ADJUSTABLE COLLAR THAT FITS ALL BONNETS



Series 300 with plates as standard equipment.

CONSTRUCTION

Each part is selected for long life. Tank and valve assembly—pure copper and brass. Evaporating pan—Vitreous enameled. Vapoglas 100% pure glass unaffected by chemicals and heat.

YOU SAVE TIME and money on your installations when you sell Skuttle Automatic Humidifiers. One look at this cross section view and you can clearly see how their adjustable collar makes it possible for you to install these Skuttle units in less time than the ordinary style of humidifiers. Available in 18″ to 30″ sizes.

Prompt shipment! Write for prices

517 E. LARNED — Skuttle Mfg. Co. — DETROIT 26 MICH

WHITNEY

LEVER PUNCHES

NUMBER FOUR "B" PUNCH

This punch for sheet metal work has a capacity of ¼" through 16 gauge. Weight 3 lb. Length 8½". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop—the No. 2 Punch. Length 23". Capacity 5/16" through ¼" iron, weight 14 lbs., depth of throat 1-11/16". Punches and dies 3/32" to ½" by 1/64".

NUMBER TWO PUNCH

W. A. WHITNEY MFG. CO.

636 RACE ST. ROCKFORD ILL

Speed *Your* STAINLESS STEEL SOLDERING

with TOWNER'S

CARA-FLUX No. 400

The Solution for Your Soldering Problems

- Cara-Flux No. 400 assures a firm, dependable bond for soldering stainless steel and other hard metals. Cara-Flux etches hard metals quickly; does not crawl or creep; does not spray or splatter; and does not form pockets on stainless steel, nickel, chrome and similar metals.
- Cara-Flux is safe to use in large-scale production as it does not harm skin of workers, has no injurious fumes.
- Cara-Flux No. 400 is a Towner formula which has solved many difficult problems of a long list of large manufacturers. With information as to your requirements, our engineering service will gladly make recommendations and will send you adequate demonstration samples.
- *Send for your sample today.*

CARAJON CHEMICAL COMPANY, INC.

428 W. Main Street — Fremont, Michigan

Order from PEERLESS

• Your requirements for complete warm air heating needs—including Steel furnaces—*repair parts for all makes of furnaces and boilers.* Fittings, registers, blowers, asbestos paper, electric controls, etc. Orders will be filled as rapidly as present conditions will permit.

NEW REPAIR PARTS CATALOG
Just off the Press—Send for your copy today.

PEERLESS FOUNDRY COMPANY
1855 Ludlow Ave. Indianapolis 7, Ind.

curved line through points so obtained as shown from *3* to *5* to *3* and draw lines to the apexes *6* and *14* as shown. Then will *3-14-19-13-6-3* be the net pattern for the sides of the transitional elbow "sweep."

Laps for Riveting

Laps must be allowed and rivet holes punched before forming up the conical corners of the transition piece, as shown in both patterns in Figs. 25 and 26. The rivet holes must be carefully spaced in both patterns of the conical corners, so that the holes will coincide with one another without reaming. Along the throat and heel of the side pattern in Fig. 26 laps must be allowed and rivet holes punched as shown. These laps are bent at right angles and fitted over the *outside* of the heel and throat patterns as shown in the perspective view of the model marked *B;* the holes are carefully marked and punched so that they will match when the elbow is assembled and riveted. The bend on the line *6-14* in the side pattern is formed to fit the angle *L* in the front elevation in Fig. 23. When forming up the transition pieces make very *slight* bends on the solid lines in the patterns in Fig. 25 and 26, then round out the conical corners free from all bends or kinks so as to represent sections of cones.

Pattern for Flap Door

The pattern for the flap door is shown in Fig. 27. The profile sections indicate how the bends are made either inside or outside. The *shaded* portion indicates the *inside.* The length of the door should be a little shorter than the length of the inlet, so that the angled ends will fit and close easily inside of the inlet.

The patterns just described are for riveted construc-

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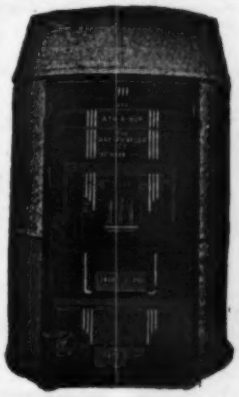

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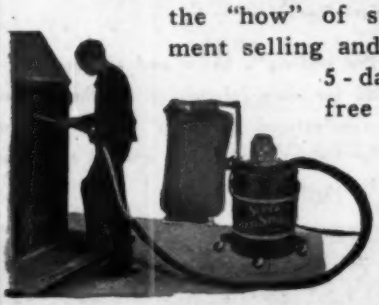

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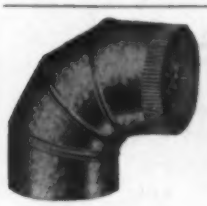

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tion. If the transition sweep is to be butt welded, then simply omit all laps and flanges on the heel, throat and side patterns and use the net pattern shapes. The flap door pattern remains the same for both construction. Hinges are riveted to the door and the inclined surface above the inlet, as clearly shown in the perspective view *B*.

•

Gravity Code In Ordinance Form

(*Continued from page* 65)

top to base by masonry partitions not less than 4 inches thick. Each flue must have a separate

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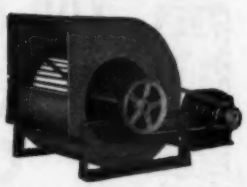

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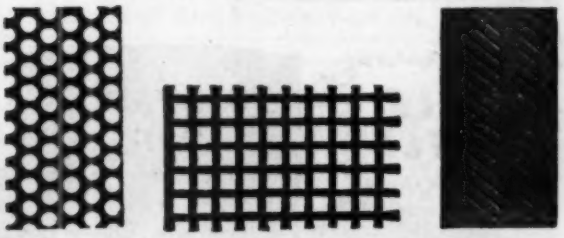

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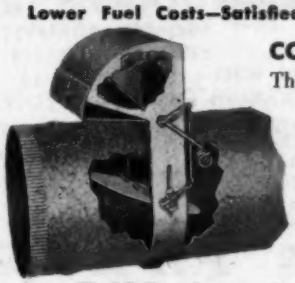

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(g) It is strongly recommended that all new chimneys be built in strict accordance with the ordinance recommended by the National Board of Fire Underwriters.

ARTICLE 8. BUILDING.

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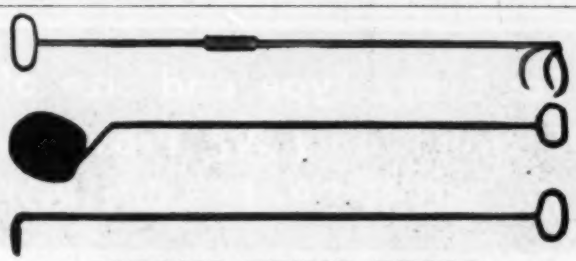

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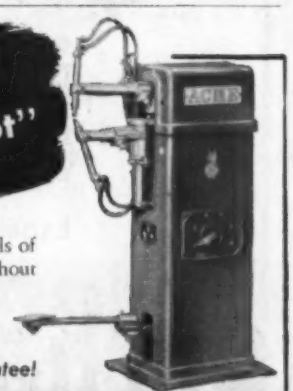

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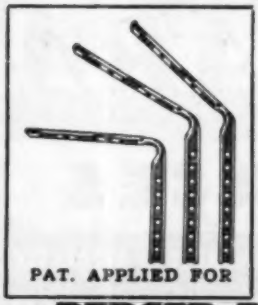

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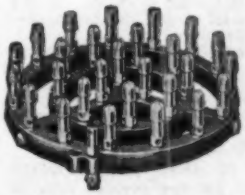

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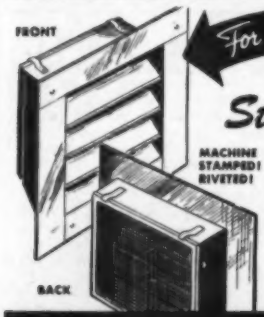

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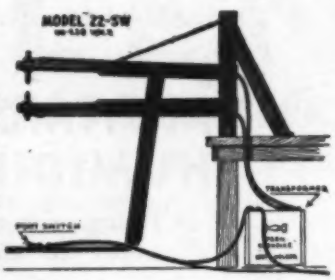

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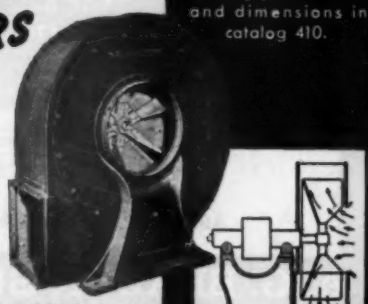

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★ ★ ★

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AMERICAN ARTISAN Service Section

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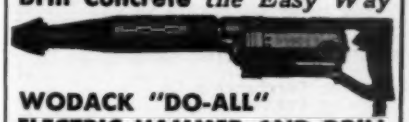

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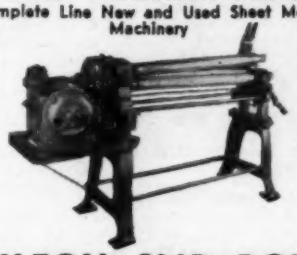

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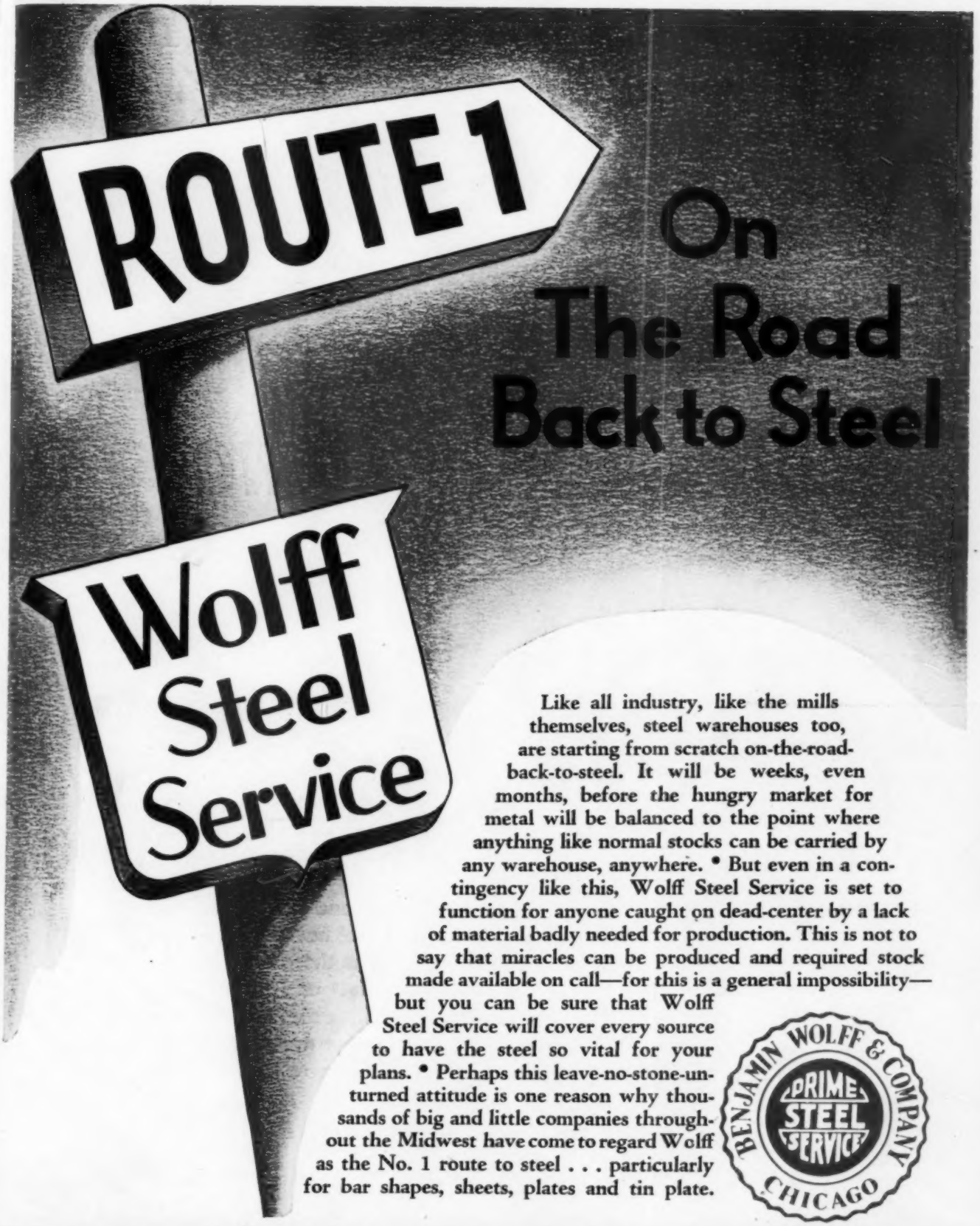

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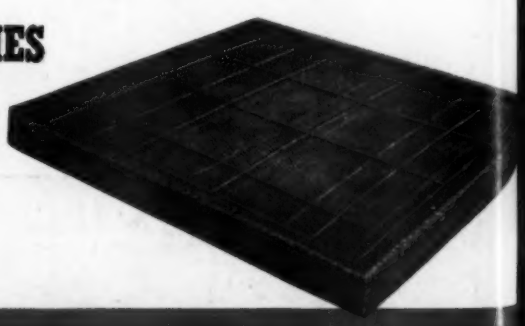

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